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California MEDICINE

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A Program for Mental Hygiene in California

DANIEL BLAIN, M.D., Sacramento

While the Department of Mental Hygiene cannot undertake to meet all the mental health needs of the citizens, it should make the best possible use of all its own resources, and at the same time help others to make the most of theirs. To these ends it should

- **Give encouragement and assistance to persons engaged in prevention of mental disorders, without trying to operate such services.**
- **Encourage and help persons engaged in the preservation of the human strengths that increase resistance to mental breakdown, without trying to operate such services.**
- **Encourage and help persons outside the department who diagnose, treat and rehabilitate patients with mental disorders if these services meet the requirements of modern psychiatric treatment.**
- **Continue operating hospitals at current level of bed capacity, clinics and related services for diagnosis, treatment and rehabilitation, moving toward levels of service in keeping with modern psychiatric standards and the growing population of the state.**
- **Continue research and training within the Department and assist others in such programs outside the Department.**

I REPRESENT the Department of Mental Hygiene, and Governor Edmund G. Brown and his administration. It is a pleasure to tell you that I have his solid support and the help of all other departments.

The time and attention of the Council of the California Medical Association is requested in behalf of the Department of Mental Hygiene because it spends 140 to 150 million dollars of state money, uses 20 per cent of all state employees (20,000) including 550 physicians, is responsible for 85,000 mental patients at some time during 1960, operates a physical plant of 700 million dollars replacement value (at $1,500 a bed), is a major factor in the whole health situation in the state and potentially could influence the health situation of the whole nation, for example in its research findings, operational methods, and pattern of sharing responsibility with various groups and with individuals and insistence on the development of more private resources.

The purpose of this report is (1) to present information concerning the program, plans, and thinking of the Department of Mental Hygiene; (2) to secure endorsement of the goals and methods underlying this program; and (3) to lay the groundwork for continued and increasing cooperation and mutual assistance between the Department and the C.M.A. and its members.

The appeal is made on the state level (1) to share responsibility for over-all planning to meet the total psychiatric needs of the citizens—and bring others into the planning process (i.e., psychiatric societies and other departments); (2) the development of sound departmental policy; (3) support on legislation and appropriation; (4) advice and close association with staff and appropriate committees.

On the county level, a request is made for a formal advisory relationship with county societies; combined investigation of the psychiatric needs and resources of every county; familiarity and interest

Director of the State Department of Mental Hygiene, Sacramento 14.
Presented to the Council of the California Medical Association, September 10, 1960.

in operation of this department and its representatives; help in raising the level of treatment available for patients from the county going to a state hospital, and assistance to them on return; sponsoring of training courses in psychiatry; active relationship to legislators and county government in behalf of the department, public education and public relations.

On the individual level, the department hopes for the active interest of every physician in its program, the use of part time services, participation in local psychiatric and mental health efforts, and assumption of greater treatment responsibility for psychiatric disorders in his patients to the end that fewer patients will be sent to distant state hospitals.

The general psychiatric situation in the nation and in California is characterized in part by considerations such as these:

In the past decade psychiatric treatment has undergone decided change. Additional techniques have been developed for use with both inpatients and outpatients. There has been a considerable increase in the number of psychiatrists in private practice, greater familiarity with psychiatric knowledge on the part of non-psychiatric physicians, and the development of psychiatric beds in local public and private general hospitals. There has been the growth of outpatient clinics, day hospitals, half-way houses and social rehabilitation services, and the development of a better understanding by the general public of the nature of mental illness with subsequent reduction of the stigma attached to such illness and greater acceptance of persons with mental disorders. A program must be responsive to this increased public concern about mental illness and must take bold advantage of these psychiatric advances. At the same time it must remain keenly aware of the many and varied demands on state resources and tax revenues.

In order to summarize my review and conclusions, I should like to present:

1. The scope of the problem;

2. Current strengths and weaknesses of the Department of Mental Hygiene;

3. A comprehensive mental health plan making maximum use of public and private resources;

4. A proposed program for the Department of Mental Hygiene consistent with such a review.

SCOPE OF THE PROBLEM

Recent research has indicated that 10 per cent of all citizens have sufficient symptomatology to warrant a diagnosis of mental disorder.* This means that in the United States there are approximately 17 million mentally ill, and in California 1.5 million. About 20 per cent are in mental hospitals or in general hospitals with psychiatric units or are seen in the private offices of physicians, chiefly psychiatrists, and in outpatient clinics. Some are in general nursing homes and some are being treated for chronic illnesses concurrent with their psychiatric difficulty. About 80 per cent, therefore, are still in the community, looking after themselves, with varying degrees of disability and dependence on others.

The full scope of the field of mental health, however, involves more than the treatment of the mentally ill. It includes four major areas:

1. *Primary prevention* of mental disorders by such techniques as appropriate prenatal and obstetrical care to avoid brain damage; appropriate attention to the medical care and diet of infants to avoid infant syphilis and cretinism; immunization against communicable diseases that may produce brain disturbances; and, on the broadest scale, the relief of stress of people whose emotional reactions are related to the stress stimulant.

2. *Promotion of healthy, well-adjusted citizens* with strength and resistance to mental breakdown through such established institutions as home, school, church, and job.

3. *Discovery, diagnosis, treatment, and rehabilitation* of mental disorders by means of inpatient, outpatient, and transitional facilities (both public and private).

4. *Promotion of the necessary resources* of knowledge (through research), of skilled personnel (through training and recruitment), and of improved inpatient and outpatient facilities (through architecture and planned construction).

For the State of California, the immediate future will likely be marked by:

1. Continued increase in the general population.

2. Increased demands by a better informed and knowledgeable people for more psychiatric services as a reflection of the developments in the field of mental health throughout the country.

3. Demands for outpatient clinic staffs and hospital staffs to give much more of their time and energy outside of the hospital and clinic for various community services.

4. Increasing demands on the relatively few personnel available to develop local services as part of the Short-Doyle program.

5. A demand for services closer to the home of the patient.

This total job can only be done by the utilization of all resources working in a cooperative fashion. This is not only a matter of necessity but represents the soundest approach. It calls for the united efforts

*Pasamanick, B., Robert, D. W., Lemkau, P. V., and Krueger, D. E.: A survey of mental disease in an urban population—Prevalence by age, sex and severity, Am. J. Pub. Health & Nation's Health, 47:923-929, Aug. 1957.

of the person who is sick, his family, his friends and associates, his medical community, plus the resources of local, state, and federal governments. The program of the future, therefore, will recognize the existence of current resources, including the large mental hospital, utilize the most scientific manner, and develop other resources in keeping with the best available scientific knowledge.

This calls for the building up of services which: (1) Permit prompt hospitalization when hospitalization is needed, but (2) permit treatment of the patient while he is living at home and continuing on his job in his usual surroundings, and (3) allow for the prevention of mental disorder and the promotion of mental health.

CURRENT DEPARTMENTAL STRENGTHS AND WEAKNESSES

Examination of the operations of the Department of Mental Hygiene has revealed certain areas of relative strength and others of relative weakness.

A real asset has been the support by the Administration, the Legislature and the people of the State, which has resulted in progressive strengthening of the Department's program. The amount of money expended by the State per patient per day has increased from $1.10 in 1946 to $5.85 in 1959, an increase of more than 500 per cent. Despite this, the overall expenditure per patient day is still only about 20 per cent of that spent in general hospitals per patient day.

The Department of Mental Hygiene may be justifiably proud of its record in a rapidly expanding state. Since 1950 the population of California has increased by 49 per cent, while during this period the number of beds in the Department of Mental Hygiene has increased by only 14 per cent. In 1950 the Department operated 303 beds for the mentally ill for each 100,000 of the general population, while in 1959 it operated only 246 beds per each 100,000 of the general population. If the rate of 303 per 100,000 population had been maintained, this would have necessitated an additional two large mental hospitals with a total of 8,500 beds.

During the past dozen years, a steadily increasing number of patients has been admitted to departmental facilities each year. Admissions have risen from 8,000 during 1946 to 23,500 during 1959, but releases have kept pace with this tremendous increase: from approximately 8,000 persons released in 1946 to 24,000 in 1959.

California has one of the best aftercare programs of any state, especially in our Bureau of Social Work program. The number of patients on indefinite leave has increased from 5,100 in 1946 to 10,000 in 1959. The family care program is especially strong and the number of patients in this program, since its inception in 1946, has steadily increased to approximately 1,500 in 1959.

The construction program is well advanced. Since 1946, the State has spent a total of $200,000,000 in Department of Mental Hygiene construction, and our buildings are generally in good condition and in a good state of safety against fire. Despite this ambitious construction program, 86 wards remain to be modernized, and some special units remain on the immediate building schedule. The remodeling of wards is progressing at a rather slow pace, and this has been one of the causes of the loss of accreditation to certain of our hospitals. Some of our buildings are too large, with a subsequent reduction in certain aspects of professional and humanitarian care of patents. In some cases, architectural design has been sacrificed for short-term economy, as in the case of the installation of fixed windows which prevent a natural flow of fresh air in a new building which is not air conditioned. Furthermore, such economy is being considered in other buildings about to be built.

The Department has a strong nucleus of competent, well-trained personnel who are aware of the needs of patients and of most recent treatment techniques. The total number of personnel has increased from 8,000 in 1946 to 19,000 in 1959, an increase of 210 per cent. Despite this, in some part of every hospital, shortages of personnel leave many patients without all the professional help and nursing supervision they require. The Department's accident rate, including compensable illnesses, costs $800,000 a year, with hidden costs bringing this up to a total of $3,000,000 yearly. Recent staffing studies indicate that personnel who are in direct contact with patients are at approximately 40 per cent of the necessary level to provide minimum adequate care and treatment. Furthermore, salaries, while comparable to those of other states, are sufficiently below competitive levels within the State of California to make recruitment difficult and to result in a rapid turnover, especially of the more highly-trained and qualified personnel.

A good start has been made in the direction of a well-planned in-service training program for all personnel and a well-planned research program. Since 1943, with the establishment of the Langley Porter Neuropsychiatric Institute, the Department has been interested in research and training, and during the past two years this interest has been considerably expanded into planned programs in both fields. The new buildings of the U.C.L.A. Neuropsychiatric Institute will be available in 1961. Research and training are going on in every hospital and clinic.

Every hospital has a number of strong points in its program. The care, treatment, and control of

tuberculosis among hospitalized patients is at a very high level. But the allotment for general drugs and medical supplies is less than is needed for good, modern general medical care, and, as more physicians from the community come into our hospitals to consult with us about our patients, the demand for drugs and medical supplies is increasing.

Our medical records on patients are inadequate. Inspectors from the Joint Commission on Hospital Accreditation have usually been most critical of this part of our hospital operation. In general this is due to a shortage of clerical personnel.

On the other hand, our Bureau of Patients Accounts has shown increasing collections, with resultant profit, and our guardianship program is unique and most helpful to patients.

Through all the Department's operations there is reflected a pervading question: Is the authority of the Director of Mental Hygiene commensurate with his responsibilities? The administrative processes, both within the Department and between Mental Hygiene and other state departments, urgently require critical study. A reasonable increase in delegation of authority and easier administrative operation must be permitted in order to free top personnel for constructive and imaginative thinking and planning.

All in all the State of California can be justly proud of its achievements and strengths. By the same token it must look carefully at its deficiencies and weaknesses with a view towards correcting and strengthening its part in the total mental health picture of the State. This is a current problem in face of the almost overwhelming population increase each year.

A COMPREHENSIVE MENTAL HEALTH PLAN

It is the thesis of the Department of Mental Hygiene that the broad scope of the mental health field requires a cooperative sharing of responsibilities by: (1) Private individuals, organizations, and institutions in the health and welfare fields; (2) federal, county, and municipal government; (3) state government. The state government of California may exercise its responsibilities in mental health chiefly through the Department of Mental Hygiene, but it supplements this with activities in the Youth Authority and Corrections, in the Departments of Public Health and Social Welfare, in the Departments of Education and Veterans Affairs, and in other state agencies and units. All provide services which conserve and increase the strengths of people; all actively evaluate their operations, and the evaluation cannot but increase our knowledge and improve our services and facilities in the broad field of mental health.

The State Department of Education provides vocational rehabilitation and the Departments of Mental Hygiene and Corrections and the Youth Authority are engaged in the broader gamut of diagnosis, treatment, and rehabilitation of the mentally disordered, both by direct operation of services and by financial aid and consultation to others providing the services (as in the Short-Doyle Act).

Federal funds and consultation are available to help in psychiatric and mental health research and training. Federal funds and consultation to local education and public assistance programs contribute to the development of a citizenry which is more resistant to mental breakdown. The Veterans Administration and the Office of Vocational Rehabilitation provide diagnosis, treatment and rehabilitation of some mentally ill and mentally retarded persons. The Hill-Burton Act and the National Mental Health Act stimulate the local development of community treatment services, including the establishment and initiation of privately operated institutions.

Meanwhile, cities and counties operate schools, health departments, general hospitals, welfare departments and recreational units all of which contribute primary prevention and the conservation of basic human strengths, often in times of personal crisis. Detection, diagnosis, treatment and rehabilitation of persons with psychiatric problems is conducted in psychiatric units of county hospitals and in county-operated outpatient clinics and rehabilitation centers. Through evaluation of local operations and financial support of inservice training, local governments contribute to the pool of available knowledge and of skilled personnel.

Private organizations and individuals, through their direct activities and their funds, promote the development of a healthy citizenry by their participation in education, religion, social welfare, employment, and so forth. Private hospitals and clinics, private nursing homes, private physicians, psychologists, social workers, nurses, rehabilitation workers —all are engaged in treatment and rehabilitation of the mentally ill and retarded. Individuals pay for their own training, private foundations and agencies support and conduct research and training, and professional persons give their time and skill to research and training—often without pay.

Thus, whether conceiving of a statewide program or of a local, regional program, one can envision private and governmental resources (at federal, state, county, and municipal levels) sharing in the development and operation of services, without any one group accepting total responsibility.

To properly evaluate the potential effectiveness of such a division of efforts, let us now look at the mental health needs of the people of California and assess our responsibilities from this perspective.

The population may be divided into four categories, or zones:

Zone I—The Prenatal and Birth Population

This population has a genetic inheritance, fetal development, and reactions to the birth experience itself. Most who are live-born are healthy; a few are already impaired.

Zone II—The Normal Population

They move from birth into normal functions in our society. As infants, children, adolescents, adults and the aged. They influence and are influenced by their diets, climate, families, schools, churches, jobs and various social institutions. They face stresses and cope with them. They have the usual ups and downs, but do not require formal, outside assistance.

Zone III—The Troubled Population

These people have special needs. They turn to "trouble-shooting" or "caretaking" agencies and resources. They seek help from doctors, hospitals, and health departments; from social agencies, welfare departments, and public assistance bureaus; from organizations for crippled children, orphans, and transients; from police, probation departments, and the courts. They are under stress and they have emotional problems secondary to the stresses, but they are not essentially psychiatric problems.

Zone IV—The Mentally Ill Population

These people are mentally or emotionally ill. They may have developed emotional responses to stress which are too serious to respond to the Zone III resources, or they may have brain damage or deficiency. They require psychiatric clinical services.

People from Zone I generally move to Zone II, but may instead move directly to Zone III or IV. Thereafter people may move from zone to zone, back and forth.

Primary prevention is intended to move people from Zone I to Zone II and to keep them there. Efforts to conserve strengths and increase resistances to stress often move people from Zone III to Zone II. Diagnosis, treatment, and rehabilitation are all intended to move people from Zone IV to Zone II or III. Research, training, and improvement of facilities are intended to improve the service to people in all four zones.

Modern psychiatric approaches demand that the patient in Zone IV receive adequate treatment as early as possible, with as little dislocation as possible, with as much continuity as possible and with as much social restoration as possible, so that he may be returned more quickly to Zone II or III. Psychiatric services must, therefore, be located where they can meet these conditions and where they may care for the patient (1) Without loss of his job, but (2) If that is necessary, without his leaving home, but (3) If that is necessary, with his remaining in the community, but (4) If that is necessary, without loss of his community ties and relationships.*

A PROPOSED PROGRAM FOR THE DEPARTMENT

It is clear, then, that the Department of Mental Hygiene does not, cannot and should not undertake to meet all of the mental health needs of the citizens of California. In a comprehensive plan to make maximum use of all resources, the Department of Mental Hygiene should:

1. Further motivate and provide technical and consultative assistance to those who are engaged in the primary prevention of mental disorders, but should not operate such preventive services directly.

2. Further motivate and provide technical and consultative assistance to those who are engaged in the conservation of those human strengths which increase resistance to mental breakdown, but should not operate such conservation services directly.

3. Further motivate and provide technical and consultative assistance to those outside of the Department of Mental Hygiene who diagnose, treat, and rehabilitate the mentally disordered when such services meet the requirements of modern psychiatric treatment as outlined above.

4. Continue to operate hospitals at current bed level, clinics and related services for the diagnosis, treatment, and rehabilitation of the mentally ill and mentally retarded with increased attention to the requirements of modern psychiatric treatment as outlined above. (Increased services can be financed in part by savings from new beds not needed.)

5. Continue to engage in research and training alone and in cooperation with others and assist others in their research and training in the mental health fields.

The Department of Mental Hygiene must encourage federal, county and municipal governments, private individuals and professional groups to develop adequate services in all four of the zones described. Such encouragement should come in the form of professional leadership and motivation, consultation, and technical and financial assistance in the organization and operation of services.

The Department of Mental Hygiene must also continue to operate services in Zone IV, but it must

*McNeel, Burdette H.: Personal communication.

do so cognizant of California's soaring population, psychiatric advances, and the advantages to the patient, the general population, the local community and the State of keeping people from entering Zone IV and of getting them out of Zone IV as quickly as possible. In consideration of these factors the Department must intensify its present operations. In place of more beds, the Department must improve present bed operations and increase its activities outside of the hospitals, in the local communities.

The Department of Mental Hygiene must also considerably increase its training and recruiting in order to develop more personnel for the Department's program and for the programs and services of other state agencies, of other levels of government and of private organizations and activities.

All activities of the Department of Mental Hygiene must become permeated with the research program in order to advance our knowledge in the mental health sciences and increase the efficacy of our operations.

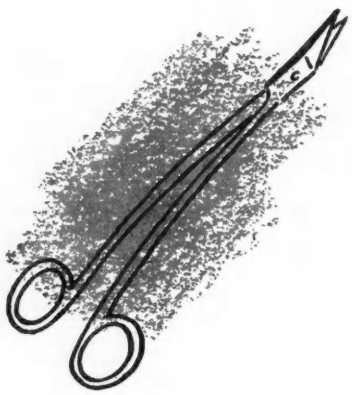
The efficiency of the Department's physical plants must be increased. To do so, present construction plans must be continued and the modernization of all old buildings must be completed.

We hope to avoid the necessity for an enormous increase in hospital beds, but the warning is before us: One other large state, which until recently emphasized only building hospital beds, now has a costly 120,000 beds for a population of close to 17,000,000. Compare this with California's 47,000!

If, by relatively small annual increments of service and by expenditures in the broad mental health field, we are able to keep up with the enormous population increases, we shall avoid building such a massive number of beds. The saving would be upwards of $750,000,000 for building and an additional $100,000,000 a year for new support, or a total of $200,000,000 annually for support alone. Hence the absolute necessity of providing the moderate increases we request from year to year.

The endorsement in principle to these goals and methods is respectfully requested.

1320 K Street, Sacramento 14.



Tracheotomy in Children

A Controlled, Planned Emergency Procedure

CHESTER M. WESEMAN, *M.D.*, Berkeley

• **The value of tracheotomy as a life-saving operation has been increased greatly in recent years by a broadening of the indications for its use. It is made safer for the patient by performing it reasonably early, and, in any event, under planned emergency conditions. The first is made possible by experience and judgment in choosing the time, mainly from close observation of the patient; the second by preceding the operation with tracheal intubation. Meticulous postoperative care is of great importance.**

WHEN TO PERFORM TRACHEOTOMY and how to perform it are questions of primary importance in the management of respiratory obstruction in children. Treatment of the various problems which may require tracheotomy will not be discussed in this paper. It is assumed that every reasonable therapeutic means is always used to avoid surgical intervention in a critically sick child. However, it is the danger of the unreasonable efforts to avoid operation, and the methods of performing the delayed operation, with which this paper is most concerned. The ideas presented are certainly not original, but as a method of procedure they have been found useful in the management of cases of respiratory obstruction at Children's Hospital of the East Bay.

Until fairly recently, tracheotomy was used only as a last resort when death was virtually certain without it. Experience gained in the management of bulbar poliomyelitis[5] in the early 1940's has resulted in a gradual broadening of the indications for performing tracheotomy.

The indications, generally accepted today, are well stated by a number of authors.[1,2,6,7,10] In addition to the circumvention of a fixed upper respiratory tract obstruction, tracheotomy may be utilized to by-pass pooled secretions, to reduce the anatomical dead space (which it does by half), to reduce respiratory resistance by eliminating friction at the normal laryngeal valve and to give direct access to the tracheobronchial tree for the management of fluid obstructions of the lower respiratory tract and the maintenance of tracheal toilet.

These factors may at times be useful in managing a variety of conditions including acute injuries[8] (head injuries, jaw fractures, severe burns), acute infections (tetanus, encephalitis, poliomyelitis), cerebrovascular accidents, various causes of pulmonary failure[1] and the administration of anesthesia in certain injuries or cases of arthritic or cicatricial fixation of the neck and jaws.

The determination of the time to intervene surgically in the relief of respiratory obstruction is a matter of considerable judgment, and may in some cases represent the combined opinions of several physicians of different special skills. The broadened concept of the indications for and the value of tracheotomy has brought the realization that it need not be a last-resort emergency operation. It is this point that should be stressed in the management of the more common condition of transitory fixed upper respiratory tract obstruction such as is seen in cases of acute inflammation of the glottic area in children.

The decision regarding whether to operate or give the patient a further test of time can only be made after careful observation. The child should be watched, if possible, through a period of agitation (which usually accompanies the performance of certain nursing duties) and a period of rest. It is important to plan all the necessary, uncomfortable manipulations such as the taking of temperature, drawing blood, getting material from the throat for culture and the giving of injections, and do them at one time rather than disturb the child repeatedly. This will permit earlier and easier evaluation of the patient's respiratory status.

If, after a period of observation, the child is noticeably tiring, and there is no reasonable expectation that the obstruction will spontaneously reverse within a few hours, it is wise to perform a tracheotomy at that time rather than to risk having to do an emergency last-resort operation. In this regard, the facial expression and emotional state (presence of agitation) are more reliable signs of anoxia and fatigue than is the patient's color. If one waits for the occurrence of cyanosis before relieving obstruction, the prolonged anoxia may disturb respiratory physiologic processes to such an extent[10] that the pa-

Presented before the Section on Ear, Nose and Throat at the 89th Annual Session of the California Medical Association, Los Angeles, February 21 to 24, 1960.

tient's recovery is greatly jeopardized. In severe respiratory acidosis the patient may arrive at a point at which the only remaining stimulus to respiration is the effect of the anoxemia on the carotid and aortic chemoreceptors, which have become the peripheral respiratory centers. In this event, attempts to correct anoxemia without removing the obstruction would be expected to cause apnea and death.

If one feels that a test of time is justified, there are certain details that must be considered. The patient should be clearly visible and audible to a trained attendant at all times. Some, otherwise very satisfactory, individual humidification units become so foggy inside and the nebulizer makes so much noise that the patient cannot be seen or heard by the nursing staff, unless the unit is placed very close to the nursing station or personnel is assigned to work in the room or ward continuously.

If the child is excessively upset, particularly on being confined in a tent, the best solution may be to insist that one of the parents stay at the bedside and attempt to soothe him with appropriate caresses. Rarely the parent may be inadequate to the occasion, in which case a frank discussion followed by trial of the other parent if available; or elimination of this feature entirely may be necessary. There is frequently a temptation to use sedation in an effort to prevent the child's increasing his problem by general physical exertion and local traumatic impact on the glottis. If one can be sure that the agitation is owing to temper or unhappiness or fear, and not to anoxia, a modest dose of sedative can be very helpful. The exceptional child who reacts with more excitement, or conversely, who quickly becomes stuporous, may create an additional problem for the physician; and certainly the knowledge that this can occur should make one quite cautious in the use of sedatives.

Finally, it is essential to have a feasible plan in the event the patient becomes suddenly worse, contrary to expectations. The classical order to cover this contingency has always been "tracheotomy tray at bedside." Even with the tray at hand, the prospect of carrying out tracheotomy at the bedside is not pleasant. From the procedure of doing tracheotomy over a bronchoscope, the author, having the assistance of excellent anesthesiologists, became accustomed to do it over a flexible endotracheal tube. From this a logical step was to substitute intubation equipment, first bronchoscopes and later endotracheal tubes, for the bedside tracheotomy tray. The intubation sets that are used contain appropriate sized battery-powered laryngoscopes, an assortment of endotracheal tubes, soft rubber aspiration catheters and a bite block. It is generally accepted that it is easier and safer to perform intubation than tracheotomy, under conditions existing at the patient's bedside.

Thus, with the aid of tracheal intubation instruments, tracheotomy is converted to a planned emergency whether it be in the ward, in the emergency room or in surgery. If done in surgery, the anesthesiologist proceeds as he would for endotracheal anesthesia in any other kind of case. It is advisable to have a rigid bronchoscope ready in the event of unforeseen difficulty. The anesthetic is induced with nitrous oxide-oxygen mixture, the larynx exposed and inspected and the endotracheal tube inserted. From then on the procedure is carried out in an unhurried, orderly manner.

A short transverse incision is used in the skin at a level midway between the cricoid cartilage and the superior border of the sternum. In selecting this level, the patient's head should be moderately extended by placing a towel roll or a sandbag under the shoulders. The deep fascia is exposed and incised in a vertical plane. The dissection is mainly blunt and is carried down to the trachea without skeletonizing it. A vertical incision is made through two exposed rings; the isthmus of the thyroid gland, if exposed, is usually displaced upward. It has been found that with the foregoing procedure, the tracheostomy will usually be made through the third and fourth rings.[11] A tracheotomy tube of appropriate size and curve is inserted after the endotracheal tube has been withdrawn, under vision, to the upper limits of the tracheal incision. The tube should be secured with tapes, tied with a square knot. A single silk suture is usually placed near each end of the incision after the tube is in place.

The advantages in doing tracheotomy over a tube have been recognized for many years. Certainly, comfort to the surgeon is an important consideration. The conversion of an emergency to a planned procedure is of advantage to the patient beyond the instantaneous relief of his respiratory distress. It virtually eliminates the hazard of pneumothorax, whether it be spontaneous from gross respiratory effort, or secondary to surgically opening the pretracheal space in the presence of respiratory obstruction, or from injury to the dome of the pleura while dissecting in the neck under difficult conditions. Also eliminated is the danger of massive hemorrhage from anomalous large vessels.[9]

Bigler and Holinger[3] advised doing tracheotomy over a tube in all cases with the exception of those with deformity of the cricoid cartilage or complete laryngeal atresia, in which it is impossible to intubate the patient. In these fortunately rare cases, tracheotomy must be performed immediately if the newborn infant is to survive. Davidson[4] cited the case of an 8-year-old with pronounced tracheal

TABLE 1.—*Reasons for Tracheotomy in 13½-Year Period Through December 1959 at Children's Hospital of the East Bay*

	No. of Cases
Laryngotracheobronchitis	48
Epiglottitis	13
Associated with other surgical procedures	20
Thoracic operation	7
Tumors face and neck	4
Endoscopy	4
Postsurgery aspiration	1
Neurosurgical procedure	1
Plastic operation	1
Acute injury	2
Congenital anomaly	7
Tetanus	2
Subglottic stenosis	2
Meningitis	1
Bulbar poliomyelitis	1

crusting and glottic swelling, in which he felt that placing a flexible endotracheal tube before tracheotomy would have been less satisfactory than introducing a bronchoscope, since preliminary removal of the crusts was necessary before the obstruction was relieved.

With rare exceptions, then, the endotracheal tube will be found to be as useful as the rigid bronchoscope for the emergency relief of obstruction before tracheotomy. Once in place it is safer because of its flexibility, and the patient can be moved as required, without the problem of keeping him in proper position in relationship to a rigid tube. Furthermore, an adequate endotracheal tube intubation set is simpler and less expensive to supply than a limited bronchoscopic set. Sets can be kept at hand at several locations in a hospital, and may be carried in a physician's bag.

Meticulous postoperative care is an essential feature in avoiding development of a keloid of the wound, granulations in the trachea and eventual stenosis of the trachea at the site of tracheostomy. Baker,[2] who wrote in detail about this phase of tracheotomy, advised daily changes of the tube after the first 48 to 72 hours. It is wise to have an intubation set at the bedside during the first change of tube; also an extra tube one size smaller than the tube to be replaced.

Tracheotomy was done 94 times in a period of thirteen and a half years at Children's Hospital of the East Bay for the reasons shown in Table 1. In 65 per cent of cases the operation was for the relief of obstruction secondary to acute respiratory infection. Of this group, one patient was operated upon twice, at 30 months, and again at four years of age, for obstruction due to acute laryngotracheobronchitis.

Pneumothorax was the only complication directly related to the operation. It occurred in four cases and in each instance was apparently caused by the tracheotomy tube slipping out of the trachea. There was one death in this group. In the other three cases simple aspiration of air from the pleural cavity was all that was necessary.

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Electron Microscopic Studies of Renal Disease

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• **The nephrotic syndrome, glomerulonephritis, disseminated lupus erythematosus and the Fanconi syndrome show characteristic changes with electron microscopy.**

Experimental studies of animals were carried out to determine the significance of such changes by observing reactions that occur under carefully controlled conditions. A lesion with collagen deposition that was found in the centrolobular region of glomeruli sheds new light on the function of this region. This evidence must be considered in developing an understanding of how the production of urine is controlled. Fluid-filled compartments and various bodies associated with the ultrastructure of tubule cells can be produced under conditions which suggest that these structures play a role in tubular resorption.

RENAL disease in humans and in experimental animals is being studied with electron microscopy in our laboratories as part of a systematic investigation of morphologic alterations of the kidney under physiologic and pathologic conditions. Some features of normal nephrons in animal and human kidneys will be presented, followed by a description of changes found in some human renal diseases, and finally some results of experimental work that throw light on the mechanisms of pathologic and physiologic changes.

NORMAL KIDNEY STRUCTURE

Normal glomeruli have been studied by a number of investigators in both animal* and human† kidneys. There is general agreement that the capillary wall at the periphery of glomerular loops is, at a minimum, composed of epithelium, basement membrane and endothelium. The epithelial cells have a number of primary processes giving rise to branching and interdigitating "foot processes," which cover the basement membrane (Figure 1). The basement membrane consists of a moderately dense and relatively homogeneous layer between epithelium and endothelium. On either side of this, less dense layers are frequently seen. Some investigators consider these to be parts of the basement membrane,[16] others do not include them,[13,27,43] and they have been regarded as an artifact.[7] Considerable variation exists in the reported thicknesses of basement membranes

Figure 1.—*Normal human glomerulus.* The specimen was taken by needle from a boy of 12 years who did not have clinically demonstrable renal disease, present or past. The basement membrane (BM-BC) and epithelium of the parietal layer of Bowman's capsule (Ep-BC) is at the upper left. Across Bowman's space (BS) is a group of epithelial cells (Ep) forming the visceral layer of Bowman's capsule. These epithelial cells have processes which branch and interdigitate to form foot processes (FP) which cover the basement membranes of the glomerular capillaries (C). A red blood cell (RBC) is seen in the capillary at the lower left. Endothelial cells (End) line the capillaries with a thin layer of cytoplasm which in some places is perforated (arrows). Some swelling, which may be artifactual, is present in the endothelial cytoplasm of the capillary above and to the right of the center. Intercapillary cells (I) lie in the centrolobular regions. The basement membranes in these regions are thicker and more nodular than the membranes which run more peripherally around the capillaries. We are not able to determine from the human material available whether the membranes as they appear in this picture are within the range of normal or represent the remnant of a previous unrecognized disease process (×4,600).

Figure 2.—*Nephrosis, active.* This specimen is from a 7-year-old boy who had had nephrosis for eight months before biopsy. The distinct foot processes have disappeared over most of the basement membranes. No definite thickening is found in the peripheral capillary basement membranes in this case. Basement membrane-like material (BMM) seems increased in the centrolobular areas. Focal swellings (Sw) project from endothelial cells, but a few of these may be found in normal kidneys.[6] Microvilli (Mv) develop from epithelial cells. Part of a leukocyte (L) lies near the center (×5,200).

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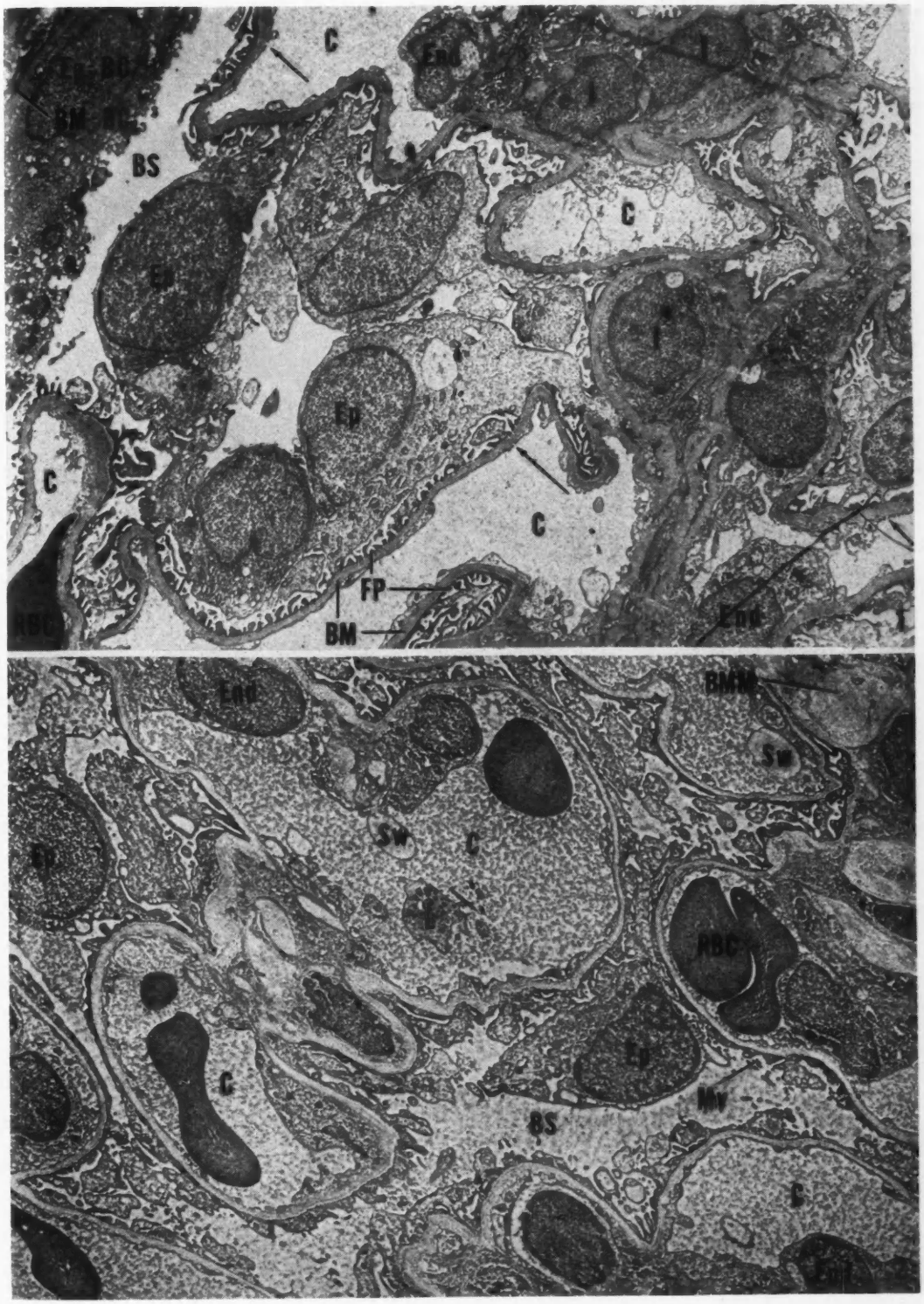
*References 1, 6, 16, 25, 27, 31, 34, 48.

†References 7, 11, 13, 14, 16, 25, 43, 46.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in normal human glomeruli: 2,600 Å[11] to 3,795 Å[7] in adults, 1,450 Å in a child,[46] and about 1,000 Å in five infants and children.[43] The basement membrane may become thicker with age.[13] Values of 1,250 Å have been reported for mice,[34] about the same for rabbits and dogs,[7] and for rats, 1,700 Å[7] or 800 to 1,200 Å.[47] The need for further study is apparent. Few biopsies of normal human kidneys have been performed.

Most of the capillary wall is lined by a thin layer of endothelial cytoplasm containing relatively large discontinuities usually called holes or pores. The holes are much too large (600 to over 1,000 Å)[27] to be considered a filtration barrier for proteins, which approximate 100 Å in diameter. The holes seem to be less frequent in human material.[7]

Whether cells in the centrolobular region of glomeruli are simply endothelial cells[6,13,16] or intercapillary cells of a different type, possibly mesangial,‡ is still unsolved. Studies to determine the location of the osmotic barrier for proteins in glomeruli have suggested either epithelial cells[12,17] or basement membranes.[8,43] It has been suggested that proteins under abnormal circumstances might pass either through "slit-pores" between foot processes[17] or by vacuolar transport across epithelial cells.[12] Defects in basement membranes have been correlated with proteinuria associated with a variety of diseases.[43]

The structures of different segments of renal tubules have been studied in experimental animals.[10,26,33,40] The best results have been obtained with tubules found in the outer part of the cortex, proximal and distal convoluted tubules and collecting tubules, which have been fixed by dripping fixative on kidneys of living animals.[26] This has not yet been done with human kidneys. Good preservation of tubules lying in the deeper portions of the cortex and in the medulla is more difficult. Although the main features of the cells found in the subcapsular position have been well described, little has been said of variations under physiologic conditions. Cytoplasmic bodies other than generally recognized forms of mitochondria, endoplasmic reticulum or granular cytomembranes, and the agranular Golgi systems, need considerably more study. Only the barest beginning has been made in elucidating the mechanisms by which tubule cells perform their functions of resorption and secretion. This will be discussed in a later section.

‡References 4, 5, 25, 31, 39, 41, 45, 48.

Figure 3.—*Nephrosis, remission.* The specimen is from a boy four and a half years of age who had had nephrosis for two years, followed by a steroid-induced remission several months before the biopsy. Foot processes are present over most of the glomerular basement membrane, in contrast to their loss during active nephrosis (Figure 2). It is difficult to be sure of any thickening of the basement membranes here. The centrolobular regions (Cl) seem to have an increase in basement membrane-like material. The swelling of the epithelial cell processes in the upper right is probably due to squeezing by the biopsy needle. The basement membrane of the parietal layer of Bowman's capsule (BM-BC) is considerably thicker here than normal (compare with Figure 1) and shows clearly a layered structure. Around the capsule is a layer of periglomerular fibrosis (F) (×4,700).

HUMAN RENAL DISEASE

Several types of human renal disease have been studied by means of biopsy material obtained at laparotomy or with a special needle.

In "pure" nephrosis (also called acute membranous glomerulonephritis) the most consistently demonstrable change is said to be loss of foot processes of epithelial cells, with the basement membrane becoming covered by broad layers of epithelial cytoplasm[13,14] (Figure 2). Other changes noted less constantly are increased numbers of vacuoles in epithelial cells, basement membranes somewhat thicker than normal and sometimes with a "moth-eaten" appearance, and swelling and vacuolization of endothelial cells.[13] The change in foot processes seems to be reversible, as normal structure was reported on biopsy of material taken in a case of nephrosis during remission.[46] The correlation of changes in foot processes with severity of the clinical disease was noted in our studies, but we are less certain about reversibility of thickening and nodularity of basement membranes, especially in centrolobular areas. In cases of nephrosis in remission that we studied, basement membranes (or basement membrane-like material) in the centrolobular areas (Figure 3) seemed to be considerably thicker and more nodular than we would expect from the appearance of glomeruli of experimental animals and from study of the small amount of normal human material available in our laboratory plus that reported in the literature. We also see focal interstitial fibrosis around glomeruli or between tubules of patients in remission, upon examination electron microscopically as well as sometimes with light microscopy. In cases of nephrosis in which there is a "mixed" clinical picture, with elements of nephritis, proliferation of endothelium and thickening of basement membranes are more extensive, but distortion of epithelial foot processes is less pronounced.[13] When hyalinized glomeruli occur, they are composed of masses of material resembling basement membrane and a few cells.[13]

KEY TO ABBREVIATIONS

BB—Brush border
BC—Bowman's capsule
BM—Basement membrane
BM-BC—Basement membrane of parietal layer of Bowman's capsule
BMM—Basement membrane-like material
BS—Bowman's space
C—Capillary
CB—Cytoplasmic bodies
CF—Collagen fibers
Cl—Centrolobular
Cl L—Centrolobular lesion
D—Distal tubule
End—Endothelial
Ep—Epithelium
Ep-BC—Epithelium, Bowman's capsule
Ep V—Epithelial vesiculation
F—Fibrosis
Fib—Fibrinoid
FP—Foot processes
I—Intercapillary cells
IB—Irregular bodies
IM—Infolded membranes
L—Leukocyte
Lu—Lumen
Mv—Microvilli
N—Nucleus
RBC—Red blood cell
RG—Round granules
Sw—Swelling
SC—Subbasilar compartments
TI—Tubular invagination
V—Vacuole

Figure 4.—*Subacute glomerulonephritis.* **The specimen is from a 4-year-old boy who had had tonsillitis seven months before biopsy, followed by hematuria and edema. Endothelial vesiculation or swelling is prominent in the capillaries. Considerable basement membrane-like material has deposited in the centrolobular region around intercapillary cells. Epithelial cells have lost foot processes (arrows) and have developed microvilli (×4,900).**

Patients with acute and subacute glomerulonephritis show mainly swelling and proliferation of endothelial cells and accumulation of basement membrane-like material[13,43,46] (Figure 4). Some epithelial swelling is seen, but foot processes are usually intact.[13] Fibrinoid deposits may occur between basement membrane and endothelial cells. We would like to emphasize the occurrence of the most severe changes or deposits in the centrolobular region (Figure 4).

In disseminated lupus erythematosus, the main changes are generalized thickening of basement membranes and variable proliferation of endothelial cells[13] (Figures 5 and 6). Subendothelial fibrinoid deposits may occur and become quite large.[11]

In diabetic glomerulosclerosis the basement membranes become quite thick, and hyaline deposits, as in the material of basement membranes, appear in glomeruli and enlarge to form the characteristic nodular lesions.[8,11] Farquhar, Hopper and Moon[11] expressed belief that the deposits occur *between* "endothelial" cells, while Bergstrand and Bucht[8] believe the deposits are *in* "endothelial" cells. Further work on the centrolobular region may demonstrate more conclusively the existence of intercapillary cells and relate the nodular deposits to them. In some patients with more advanced lesions, obliteration of capillary lumens, fibrinoid deposits and loss of foot processes can be found.[11]

In amyloidosis there is localized irregular thickening of the basement membranes with thickened regions bulging out under the epithelium and also showing a lighter density than normal.[11]

In preeclampsia and eclampsia, pronounced swelling of endothelial cells and fibrinoid deposits are found.[11]

In the Fanconi syndrome (Debre-de Toni-Fanconi) the clinical defects of aminoaciduria, glucosuria and hyperphosphaturia are accompanied at an early age by considerable alterations in cells of renal tubules (Figure 7) and also by some glomerular changes. Considerable interstitial fibrosis occurs. Cystine crystals can be obtained from tissues but their exact location in relation to cells has not been previously determined. In electronmicrographs in the present study, crystals were found in interstitial regions between tubules, some apparently in the cytoplasm of interstitial cells. Some of these crystals were identified as cystine by the hexagonal shape and an electron diffraction pattern similar to that of L-cystine.

EXPERIMENTAL RENAL STUDIES

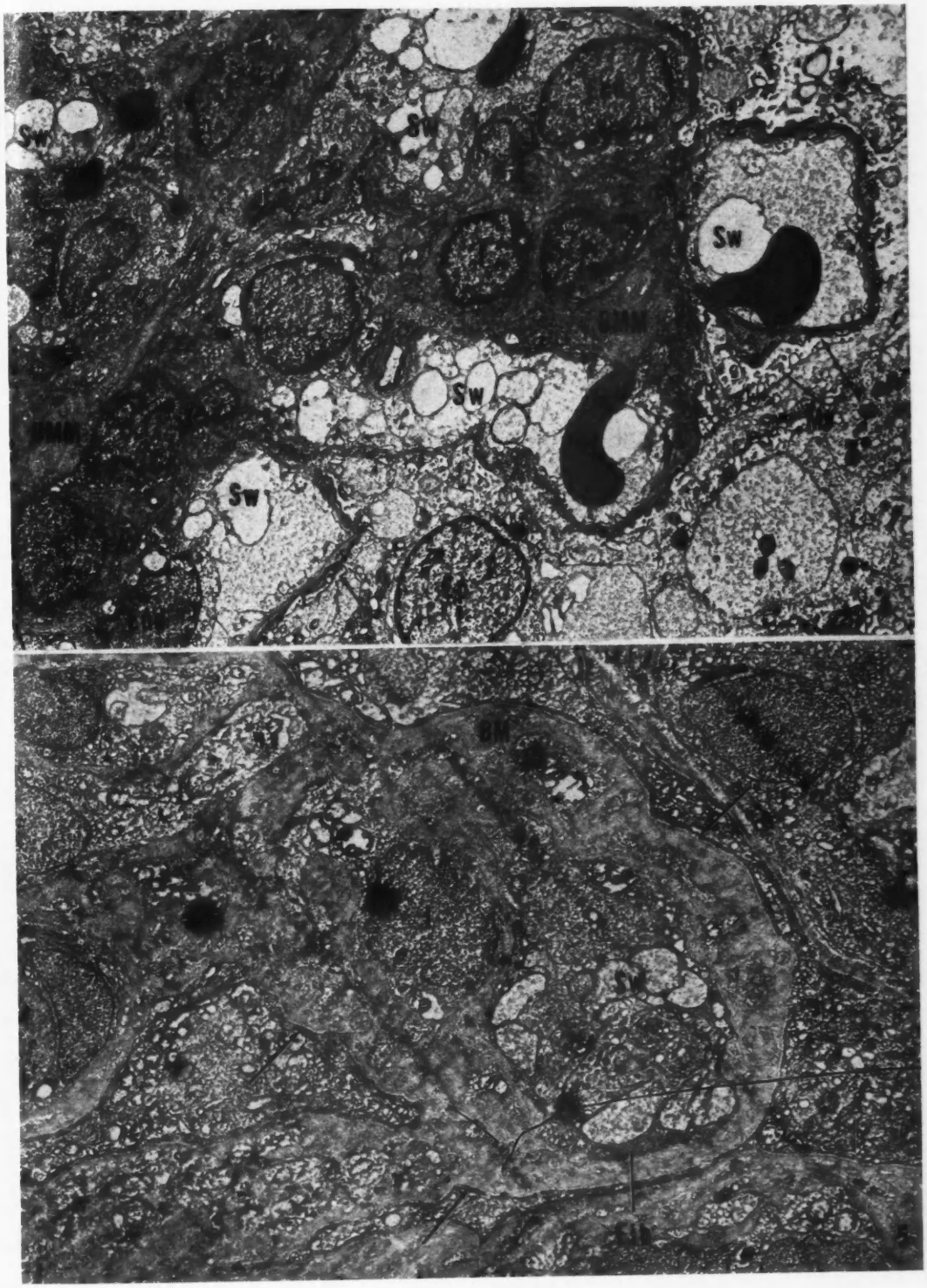
Of particular interest in the study of human diseases is comparison with similar diseases produced in animals.

Aminonucleoside nephrosis resembles human nephrosis both clinically and morphologically.[47] After seven daily injections of this drug in rats, glomerular epithelial cells showed obliteration of foot processes and an increase in number and size of cytoplasmic vacuoles. Later an increase in number of endothelial cells and in basement membrane-like material was noted. Ferritin has been injected in animals with aminonucleoside nephrosis to study the passage of a protein molecule out of glomerular capillaries during proteinuria.[12]

Nephrotoxic serum nephritis and experimental serum sickness nephritis show some similarities to human acute glomerulonephritis. Not enough information is available yet to say which more closely resembles the human disease. Nephrotoxic serum nephritis has been produced in rats and rabbits.*

*References 22, 29, 30, 32, 41.

Figure 5.—*Disseminated lupus erythematosus.* **Specimen from a 16-year-old girl who had had symptoms for three years at the time of biopsy. A greatly altered glomerular capillary shows tremendous thickening of the basement membranes. The capillary lumen has disappeared and endothelial swelling is prominent. A small subendothelial deposit (Fib) is seen. Epithelial foot processes have disappeared (arrows). Such tissue cuts with difficulty, as is shown by the knife marks across the section (×6,500).**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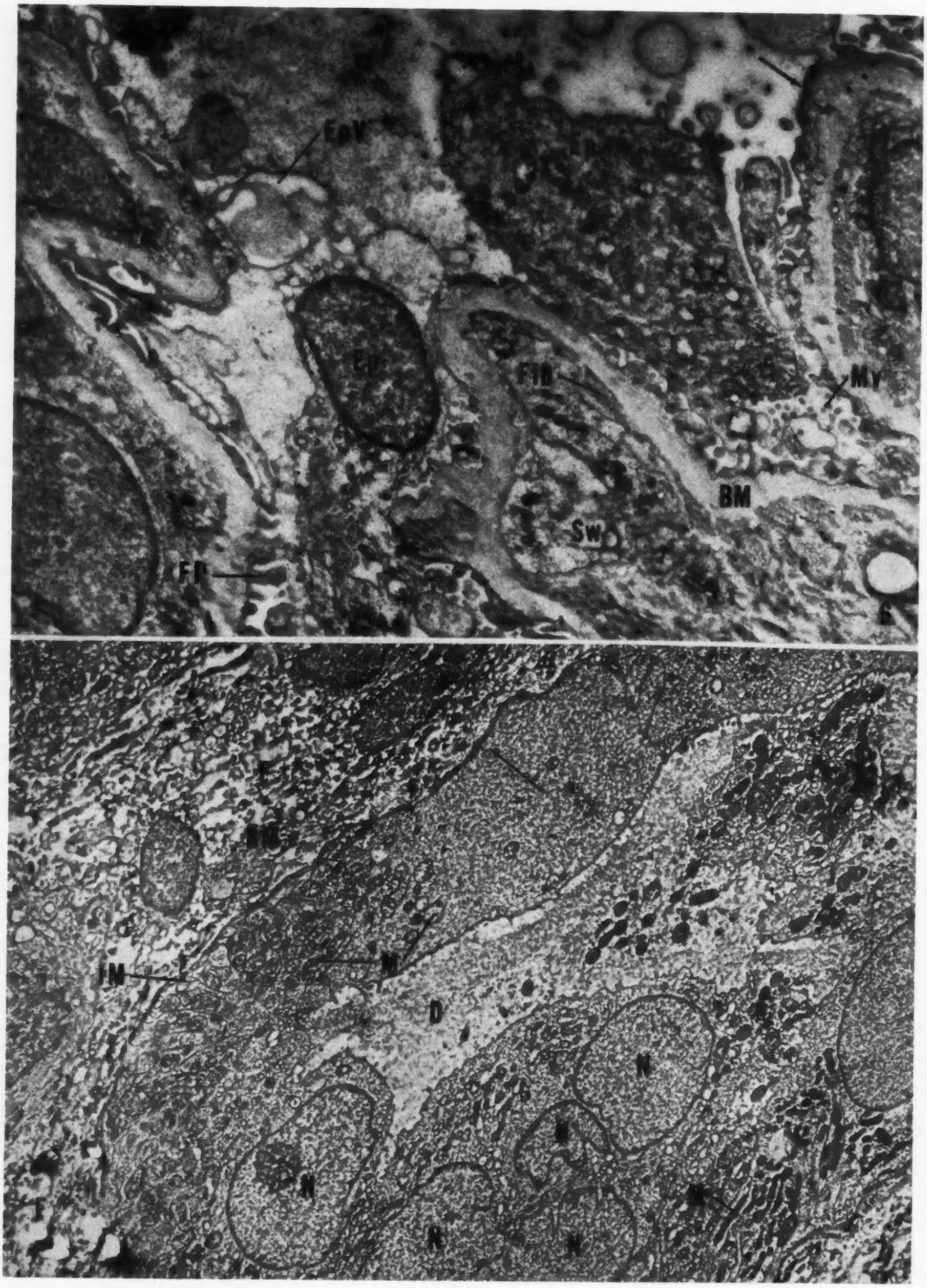
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Figure 6.—*Disseminated lupus erythematosus.* In this specimen from a 7-year-old boy the basement membranes in the glomerulus are not nearly as thick as in Figure 5. Endothelial swelling is prominent, and subendothelial fibrinoid deposits are seen. Epithelial vacuolization (Ep V) and swelling are apparent, as is formation of microvilli. Foot processes are intact in some places and broadened or lost in others (arrow). The epithelial cells have prominent membrane systems (×7,800).

Swelling,[22,32,41] vacuolation,[22] and proliferation[29] of endothelial cells are found. Swelling and proliferation of mesangial cells are also described by one group of investigators who believe in the existence of such cells in the centrolobular area.[41] Thickening of basement membranes[22,29,41] and changes in density[41] are also found. Subendothelial deposits resembling fibrinoid may be seen.[32] Epithelial cells are not as strikingly altered, but swelling,[22,29,41] vacuolization,[32] formation of microvilli[41] and slight broadening of foot processes[41] are mentioned.

In serum sickness nephritis in rabbits the glomerular capillaries are obliterated by endothelial swelling and proliferation.[15] There is loss of epithelial foot processes and focal thickening of the basement membrane. Neither in human nephritis nor in experimental nephritis produced by nephrotoxic serum or foreign antigens have large blebs formed by the outer nuclear membrane yet been found. We found such perinuclear blebs to be one of the main features of the reaction of cells in tissue culture to specific antiserum.[18,19]

Experimental renal disease has been approached in our laboratories by correlating functional and structural changes and thereby reaching an understanding of the physiologic and pathologic significance of cellular fine structures and their alterations. In starting these studies, uranyl nitrate was selected as a simple chemical affecting the kidney with known functional changes and known morphologic alterations under light microscopy. In acute uranium poisoning, animals develop proteinuria and polyuria followed by oliguria.[3] We found several changes in glomeruli, some of them previously noted. Most striking was a hitherto undescribed lesion, which appeared with a trichrome stain as a blue deposit in the centrolobular area of most glomeruli after four days.[3] It had some resemblances to human chronic lobular glomerulonephritis. Electron microscope studies showed that this deposit was intimately associated with cell processes in an intercapillary position and contained several components, including collagen fibers (Figures 8, 9 and 10). Because collagen fibers are not found in the normal glomerulus, this indicated that they were newly formed. Their association with cells in the intercapillary region suggested that these cells were different from the endothelial cells lining glomerular capillaries. This amounts to functional evidence in support of the concept that there are distinct intercapillary or "mesangial" cells. Further studies are being conducted to test whether the centrolobular region may be concerned with control of capillary blood flow and filtration.

Other changes in glomeruli include the development in intercapillary cells of dense-walled vacuoles or lipid bodies, and in epithelial cells of vacuolization, hyaline droplets and myelin figures, and partial loss of foot processes.

Figure 7.—*Fanconi syndrome.* The specimen is from a two-year-old boy who was one of three siblings with symptoms of the Debre-de Toni-Fanconi syndrome. The picture shows a distorted distal convoluted tubule (D) with several epithelial nuclei piled up together in the lower part. The mitochondria (M) in the epithelium on the left side of the tubule are swollen and fragmented as compared with the more normal smaller, denser, elongated mitochondria at the lower right. The infolded membranes (IM) of the basilar cell processes are apparent at the lower left and right of the tubule, but they are absent from the cell in the upper center (arrow). Considerable interstitial fibrosis (F) is present. In spite of this, the basement membrane of the tubule is thin (×5,300).

Tubular Resorption of Large Molecules

The renal tubules as well as glomeruli are profoundly affected in acute uranium poisoning. Necrosis of proximal convoluted tubules has long been recognized, but we have been more concerned recently with changes in non-necrotic cells which seemed to have functional significance.[2,3,44] The development of droplets or bodies in the cytoplasm of proximal convoluted tubule cells (Figures 11 and 12) occurred at the same time as proteinuria developed. The droplets in cells stained like material in the lumen of tubules and, with electron microscopy, it had a similar character. Evidence from light microscopy[10,21,23,42] has indicated that proteins which pass through glomeruli can be taken up by proximal tubule cells. A possible mechanism for the formation of such cytoplasmic bodies from substances of large molecular weight would be enlargement of tubular invaginations at the base of the brush border and pinching off to form vesicles or small bodies, which could later concentrate their contents and coalesce to form the large bodies. An increase of

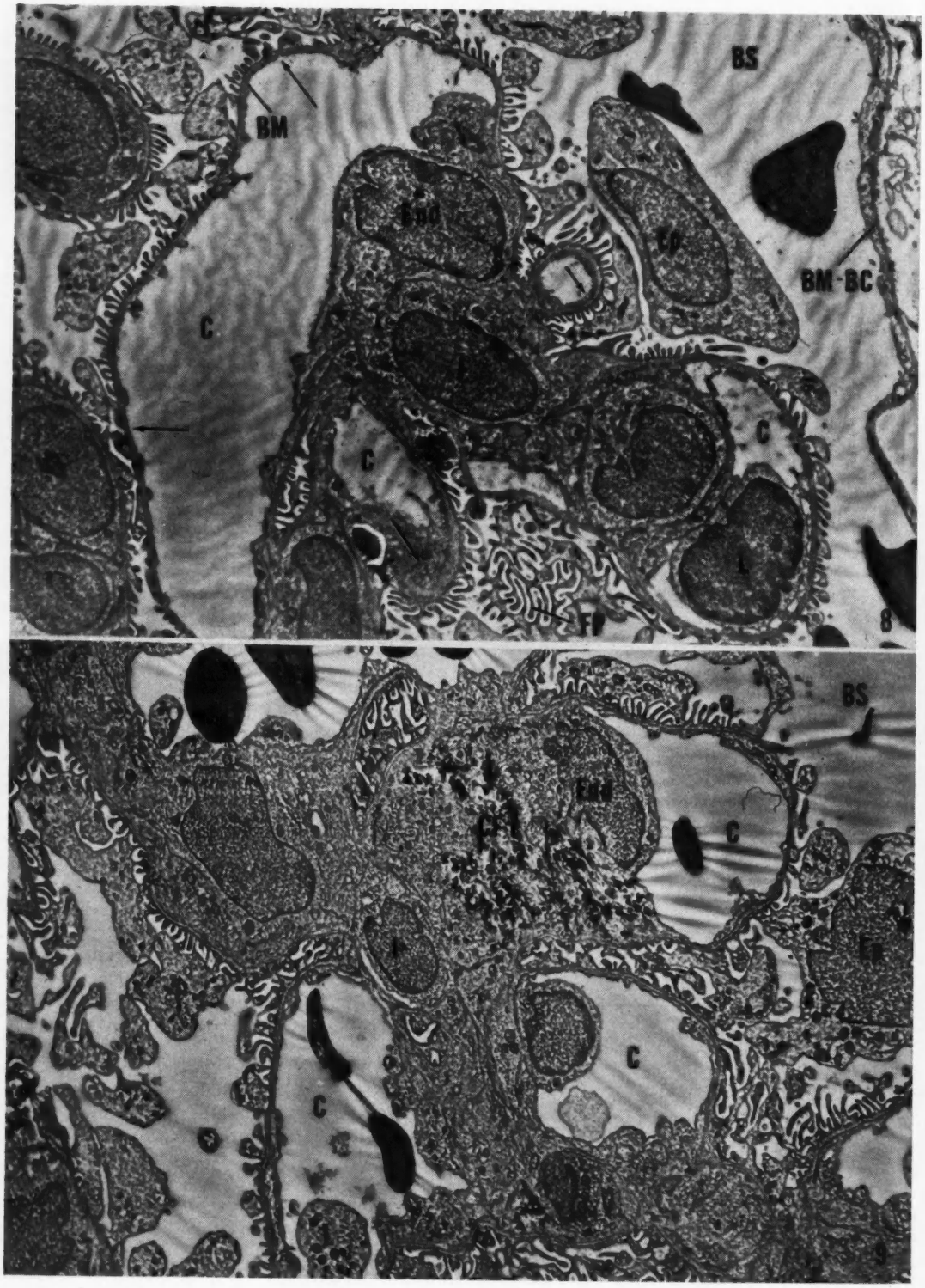
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Figure 8.—*Normal rat glomerulus.* The structures are similar in general to those seen in the human glomerulus (Figure 1). The main difference is that the rat has thinner basement membranes. Several capillary lumens surround a centrolobular area containing an interstitial cell. Endothelial pores or holes are seen in both cross and tangential sections (arrows). A leukocyte lies in the capillary at the lower right. The presence of red blood cells in Bowman's space is doubtless due to an artifact. The basement membrane of Bowman's capsule is at the right (×5,800).

small vesicles and bodies seems to precede the appearance of the large bodies, but the evidence is too tenuous at present to be sure just how large molecules move from the lumen to the bodies. Of more physiologic interest is the consideration that if the kidney takes large molecules into the cytoplasm by a vacuolar mechanism, the same system could operate for the tubular resorption of water and salts.

Tubular Resorption of Water

Evidence for tubular resorption of protein by a vacuolar transport mechanism is also evidence for a similar tubular resorption of water and salts as stated above. Although an increased number of vacuoles can be found in some cells (Figure 13) when polyuria is beginning, the evidence is not adequate that this is an important mechanism for water transport. Another mechanism is suggested by the ease with which tubular cells swell, especially in the apical portions. With uranium poisoning, such swelling may occur at the onset of polyuria (Figure 14). As kidney tubule cells ordinarily have an osmotic pres-

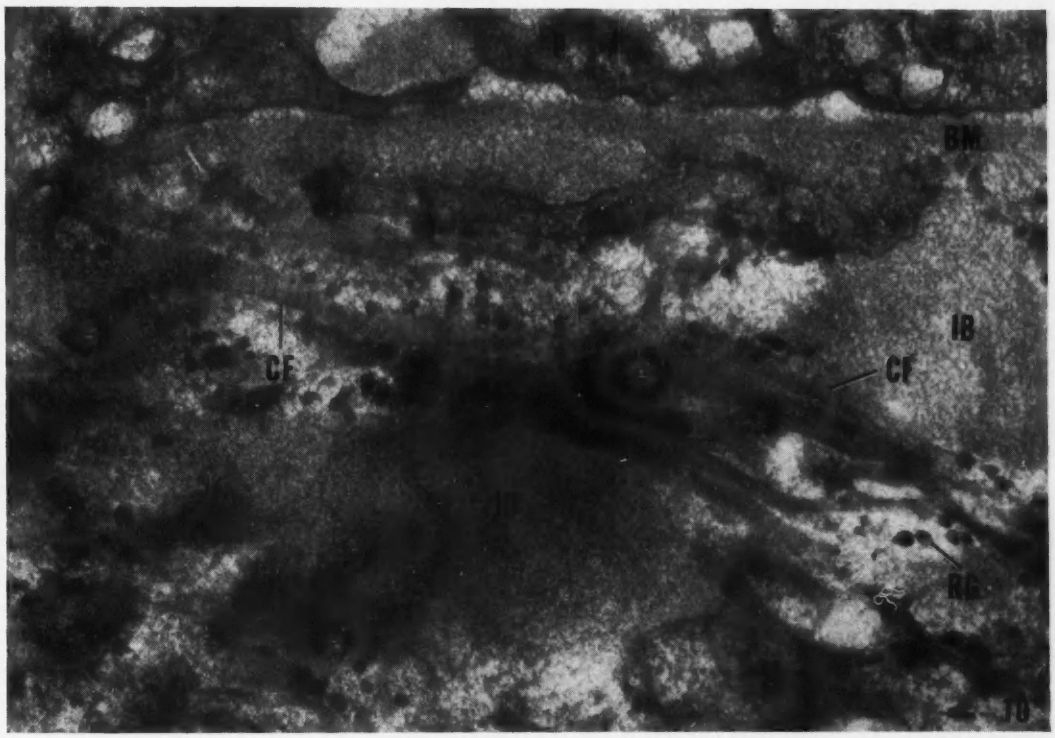

Figure 10.—*Collagen fibers in centrolobular lesion.* Higher magnification of a lesion similar to that in Figure 9. Several collagen fibers (CF) run across the picture. Three intraperiod striations are seen in these unstained fibers. The small dense round granules (RG) are about 300 A in diameter. The larger irregular bodies (IB) are denser than basement membranes when examined in thicker sections, as in Figure 9. The epithelial cell at the top has lost foot processes. The collagen fibers in these lesions occupy an unusual position on the capillary side of the basement membrane (×44,000).

Figure 9.—*Centrolobular lesion, uranium poisoning.* Specimen from a rat that was killed six days after subcutaneous injection of uranyl nitrate. A centrolobular lesion is closely associated with intercapillary cell processes and lies beneath an endothelial cell. (Compare with Figure 8.) It contains collagen fibers, small dense round granules, and larger irregular bodies, all of which are better seen in Figure 10 (×5,300).

sure higher than isotonic,[24] they could resorb fluid simply by diffusion across the plasma membrane. It would not be surprising if the evolutionary process had supplied two or more mechanisms for so important a function.

Movement of water out of cells is another problem. The bases of the proximal, distal and collecting tubule cells consist of a number of processes which interdigitate with each other or with processes from adjoining cells.[33] Normally the infolded membranes (β-cytomembranes) are in general contact, with only small separations here and there (Figures 11 and 15). However, the membranes form a potential space extending from the basement membrane around the cell processes and between adjacent cells to the terminal bars at the level of the base of the brush border. It has been shown that these cell membranes are osmotically active,[26] and that other epithelia concerned with fluid transport have a similar anatomic arrangement.[28] At the onset of polyuria following uranium injection, this potential space in a number of proximal, distal and collecting tubules (Figure 16) becomes distended with fluid, forming large subbasilar compartments. These studies seem to give functional evidence that the space is involved in fluid transport. Moreover, they indicate that all three tubular segments are involved, as has been suggested on other grounds by renal physiologists.[9] The appearance of such spaces might be interpreted as evidence of a defective pumping mechanism in the cells,[38] usually moving fluid back to the capillaries.

If subbasilar compartments represent phenomena associated with resorption of fluid from glomerular filtrate, they should be observed in the presence of polyuria produced by means other than a toxic metal. Accordingly, the posterior lobe of the pituitary was removed in one group of rats.[20] They were offered isotonic glucose to drink to aid their recovery from the operation. Their urine volume increased greatly, 20 to 30 times normal, and their kidneys also developed large subbasilar compartments. This presented more evidence for the association of compartments with polyuria. However, the increase in urine volume could not be definitely ascribed to posterior hypophysectomy because rats with a sham operation had a similar increase in urine volume. Another group of rats, not operated on, was offered isotonic glucose. They showed a similar increase in urine volume and the appearance of large subbasilar compartments (Figure 17).

The compartments have been found, in this laboratory, to be increased by the injection of uranyl nitrate or by ingestion of glucose. They have also been observed, in other laboratories, occurring with "osmotic nephrosis" produced by dialysis with glucose solutions[37] and with phenol red and diodrast excretion.[36] Further experiments are being performed to determine whether the large compartments are a manifestation of the toxic action of the agent used or whether they may be more fundamentally related to disturbed tubular resorption and increased urine flow.

Figure 11.—***Normal proximal convoluted tubule.*** **An open tubular lumen (Lu) and open capillaries are characteristic of well-fixed normal renal tissue. Beneath the brush border (BB) are tubular invaginations (TI) and apical vacuoles (V). A few small cytoplasmic bodies (CB) are seen, usually in the upper half of the cell. The mitochondria are dense. The nucleus (N) is usually placed toward the base of the cell (×7,100).**

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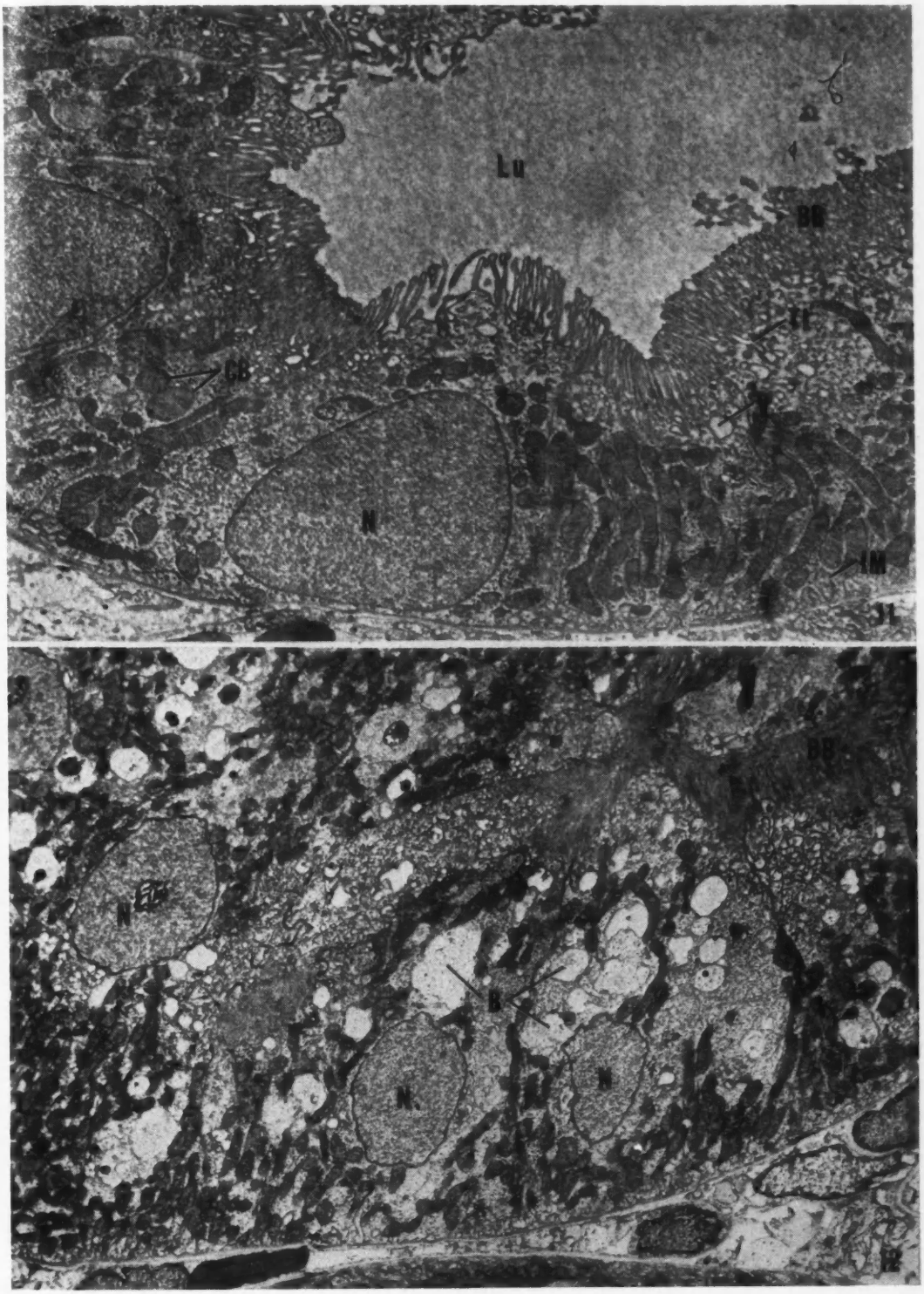
Figure 12.—***Cytoplasmic bodies, uranium poisoning.*** **Cytoplasmic bodies are increased in size and number in this proximal convoluted tubule, four days after injection of uranium. Proteinuria is pronounced at this time. Compare with Figure 11 (×4,500).**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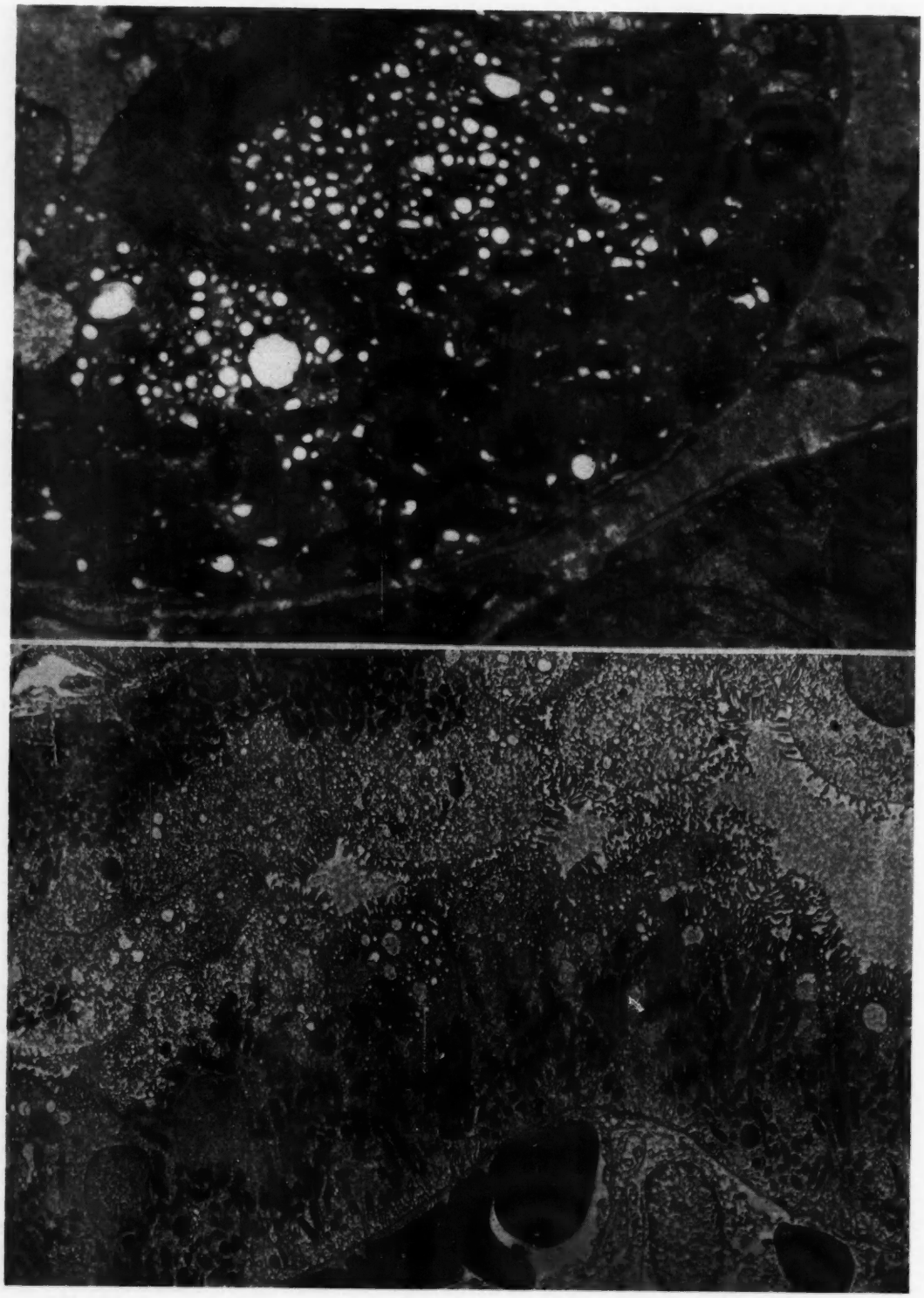

Figure 13.—*Vacuolization, uranium poisoning.* Vacuolization is prominent in some cells of the proximal convoluted tubules especially in the apical portion, 36 hours after injection of uranium. Polyuria begins about this time. Compare with Figure 11 (×11,000).

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Figure 14.—*Apical swelling, uranium poisoning.* Specimen from a rat killed two days after injection of uranium. Swelling of cells of the proximal convoluted tubule is apparent, when compared with Figure 11. The microvilli of the brush border are separated in many places. Apical vacuoles also seem more prominent here. Polyuria has started at this time (×3,000).

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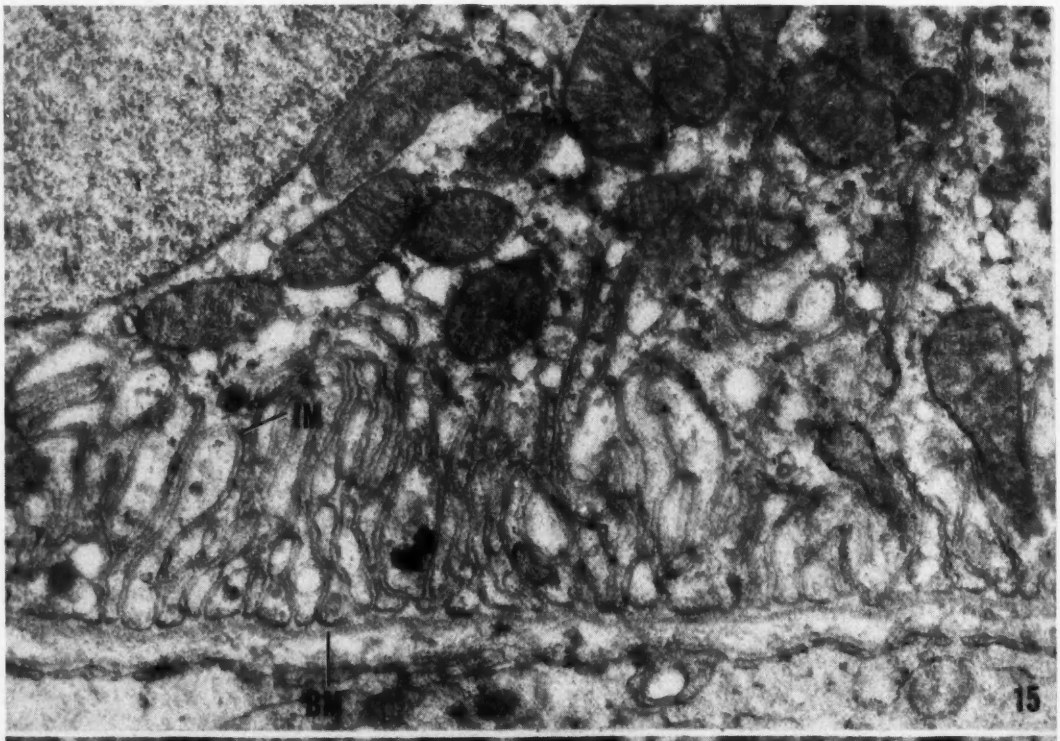
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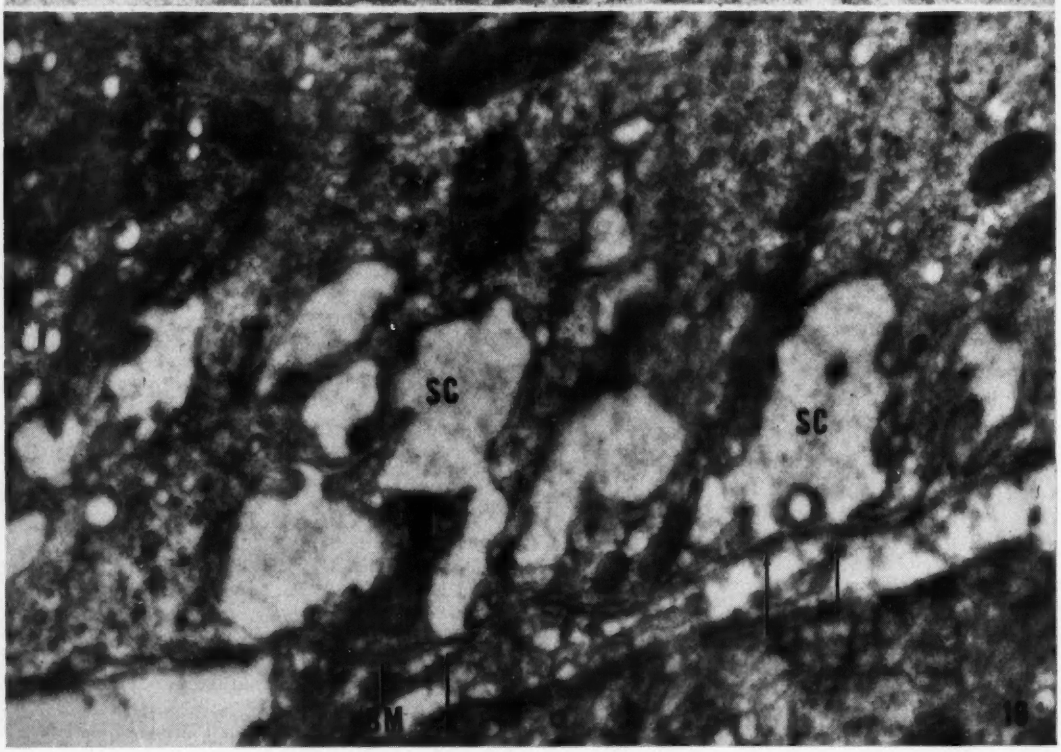
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Figure 15.—*Normal collecting tubule.* The infolded membranes at the base of the cell are in contact. The mitochondria are fewer and arranged more at random than in the proximal and distal convoluted tubules. Small dense ribonucleoprotein particles are scattered through the cytoplasm. Most of the intracellular membranes here are in the form of agranular vesicles (×28,000).

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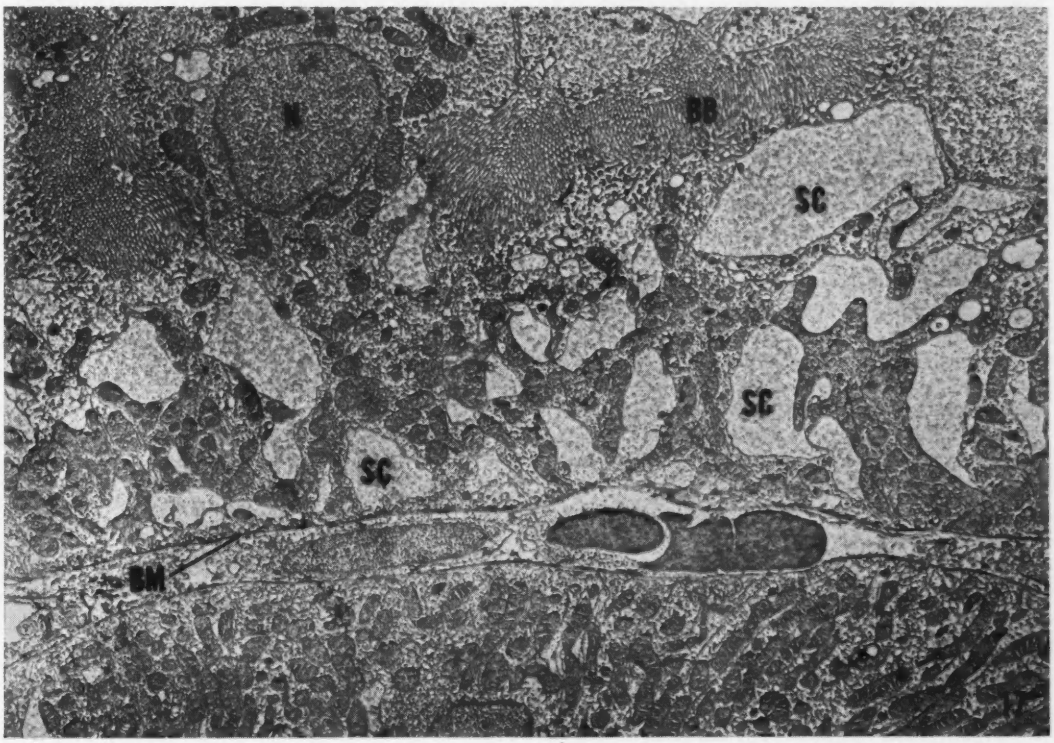


Figure 17.—*Subbasilar compartments, isotonic glucose.* Specimen from a rat that was killed after seven days of polyuria due to drinking water containing 5 per cent glucose. The large subbasilar or extracellular compartments in this proximal convoluted tubule cell extend from the basement membrane to the brush border, stopping at the terminal bars. The cell in the adjacent proximal tubule at the bottom of the picture is not involved, showing how sharply demarcated this reactive change may be. Compare with Figure 11 (×5,800).

Figure 16.—*Subbasilar compartments, uranium poisoning.* The infolded membranes of this collecting tubule are spread apart, forming compartments. Two of these subbasilar compartments (SC) are cut in a plane demonstrating their opening toward the basement membrane (arrows) and, therefore, their continuity with extracellular space at the base of the cell. These compartments become prominent in proximal, distal, and collecting tubules just before the onset of polyuria. The rat was killed 24 hours after the injection of uranium. Compare with Figure 15 (×24,000).

The Potentiation of Radiation Effects With 5-Fluoro-uracil

LAURANCE V. FOYE, JR., *M.D.*, FORREST M. WILLETT, *M.D.*, BYRON HALL, *M.D.*, and MERALL ROTH, *M.D.*, San Francisco

• **A preliminary study of the response of various inoperable malignant diseases to simultaneously administered 5-fluoro-uracil and orthovolt x-ray was performed. The 5-fluoro-uracil was given intravenously at a relatively nontoxic dosage level. The x-ray tumor dose was limited to 2,000 roentgens in every patient.**

Pronounced and rapid tumor regression occurred in 12 of 18 evaluable patients. Significant objective response was obtained in each of eight patients with epidermoid carcinoma of the lung.

Toxicity occurred in half of the patients, manifested by pharyngitis, esophagitis, proctitis, leukopenia and thrombocytopenia.

THE ANTI-CANCER EFFECTS of the substituted purine and pyrimidine compounds have been thoroughly evaluated by many investigators. Synthesized several years ago,[3] 5-fluoro-uracil, a halogenated pyrimidine, has had extensive trial in a variety of malignant tumors.[1,2,4] Curreri and coworkers[2] obtained objective improvement in patients with carcinoma of the breast, ovary, cervix, colon and rectum, and hepatoma treated with toxic doses of 5-fluoro-uracil given intravenously. They observed no beneficial effect in patients with carcinoma of the lung, stomach, pancreas, malignant melanoma or hypernephroma. Toxic effects of the compound were nausea, vomiting, stomatitis, diarrhea and bone-marrow depression and, when severe, included gastrointestinal ulceration and hemorrhage, ileus, shock, bilateral pneumonia, agranulocytosis and death.

In late 1958, one of the authors (B.H.), who was treating a patient with squamous cell carcinoma with 5-fluoro-uracil and local x-ray simultaneously, observed a degree of tumor response that suggested unusual radiosensitivity for malignant lesions of this type. In an attempt to evaluate the suspicion of possible synergism of these two modes of therapy, we initiated a preliminary study employing these agents concomitantly in patients with inoperable malignant disease. Trying to avoid severe toxicity, we used a smaller total dose of 5-fluoro-uracil than other investigators had reported.

THE SCHEDULE OF TREATMENT (Chart 1)

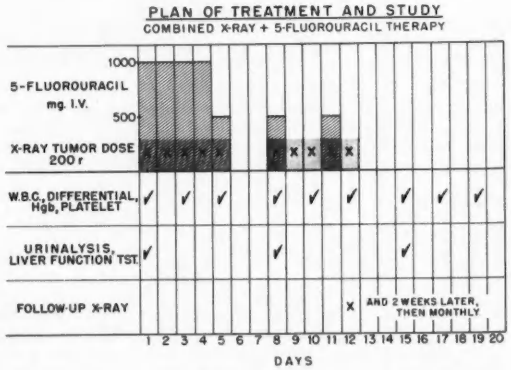
5-Fluoro-uracil was administered by slow intravenous drip (3 to 4 hours in 200 to 500 cc. of normal saline solution on the following schedule:

Days 1 through 4: 15 mg. per kg. of body weight (in no case more than 1,000 mg. a day).

Day 5 and twice weekly thereafter: 7.5 mg. per kg. (in no case more than 500 mg. a day).

The irradiation was administered at 250 kilovolts (half value layer 3 mm. of copper) in daily tumor doses of 100 to 200 roentgens, five days a week, to a total tumor dose of 2,000 r. The usual course of combined therapy required two weeks, the patient receiving approximately 90 mg. of 5-fluoro-uracil per kilogram of body weight.

The radiation dosage of 2,000 r. was chosen for several reasons. Several experienced radiotherapists stated that the majority of tumors of the type we planned to treat would not respond significantly to this dose level; this dose of radiation could be given over several areas in the same patient without undue side effects; and, finally, an increase in tumor sensitivity of a lesser degree would be of no practical value.


PLAN OF TREATMENT AND STUDY
COMBINED X-RAY + 5-FLUOROURACIL THERAPY
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5-FLUOROURACIL mg. I.V.
500
X-RAY TUMOR DOSE 200 r
W.B.C., DIFFERENTIAL, Hgb, PLATELET
URINALYSIS, LIVER FUNCTION TST.
FOLLOW-UP X-RAY
AND 2 WEEKS LATER, THEN MONTHLY
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
DAYS

Chart 1

From the Departments of Medicine and Radiology, Veterans Administration Hospital, San Francisco.

5-Fluoro-uracil was generously supplied by Hoffman-LaRoche, Inc., Nutley, New Jersey.

Submitted April 26, 1960.

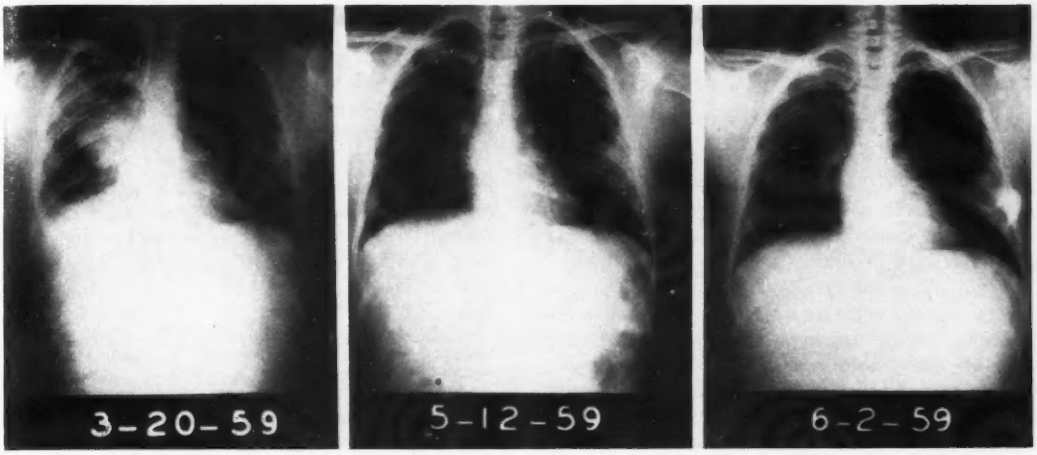

Figure 1.—Embryonal cell carcinoma, with metastastic lesions in both lung fields. *Left*, before treatment. *Center*, two weeks after treatment with 5-fluoro-uracil. X-ray (2,000 r.) was administered concurrently to the lesion in the right lung. The mass in the left lung was exposed to 5-fluoro-uracil alone. *Right*, two weeks after treatment of left lung mass with x-ray (2,000 r.) alone.

Patients were selected by the following criteria:

1. The disease must be biopsy-proven, inoperable, and measurable objectively.
2. The tumor must be of a type known to respond poorly to standard radiation therapy.
3. The patient must be willing to accept experimental therapy and be likely to survive the four to six weeks required for treatment and evaluation.

The total number included in the study was 25. The population at the hospital where this study was conducted is such that epidermoid carcinomas of the lung and larynx constitute the majority of tumors meeting the above criteria. In these two types of malignant lesions, 5-fluoro-uracil alone has proven ineffective.

The following studies were performed on every patient: Leukocyte count and determination of cell differential, hemoglobin content and platelet count three times a week; reticulocyte count, urinalysis, and determination of serum albumin, globulin, uric acid and alkaline phosphatase once weekly. The patients were examined daily for evidence of toxicity. The response of the malignant lesion to combined therapy was measured at the end of treatment and every two weeks thereafter.

TOXICITY

Toxic effects observed in this study were mild esophagitis in four patients, moderately severe pharyngitis in three and severe proctitis in one patient. In each such case the area of inflammation was within the field of radiation.

Leukopenia (less than 3,000 per cu. mm.) occurred in four patients, the number rapidly returning to normal range upon completion of therapy. Thrombocytopenia (less than 100,000 per cu. mm.) occurred in four patients, the lowest count being 55,000 per cu. mm. The thrombocytopenia was not manifest clinically.

In 13 patients, no toxic effects were noted. Not observed in this study were nausea and vomiting, gastrointestinal hemorrhage, shock, pneumonia or death. In no case did anemia or hepatic or renal toxicity occur. Two patients, each of whom received

TABLE 1.—*Results of Combined 5-Fluoro-uracil and Roentgen Therapy of Malignant Disease*

Diagnosis	Total Treated	Response			Not Evaluable
		Good	Moderate	None	
Carcinoma of lung	8	8	....	....	....
Carcinoma of larynx	3	1	1	1	....
Adenocarcinoma of rectum	2	1	....	1	....
Adenocarcinoma of stomach	1	1	....	....	....
Carcinoma of esophagus	2	....	....	1	1
Embryonal cell cancer of testis	1	1	....	....	....
Transitional cancer of bladder	1	....	....	....	1
Lymphoepithelioma	1	....	....	....	1
Carcinoma of pancreas	1	....	....	....	1
Carcinoma of tonsil	1	....	1	....	....
Clear cell cancer of kidney	1	....	....	....	1
Malignant melanoma	1	....	....	....	1
Carcinoma of scalp	1	....	1	....	....
Adenocarcinoma of lung	1	....	....	....	1
Total	25	12	3	3	7

two complete courses of combined therapy in a period of two months, experienced no toxicity of any kind.

RESULTS

Of eight patients with epidermoid carcinoma of the lung (a kind of tumor that had shown no response to 5-fluoro-uracil alone in other reported studies) all showed rapid and significant regression of the lesions receiving x-ray therapy during 5-fluoro-uracil administration. Several were in good health without evidence of tumor six months after therapy. Similar responses were observed in single cases of epidermoid carcinoma of the larynx, adenocarcinoma of the rectum, mucinous adenocarcinoma of the stomach and embryonal cell carcinoma of the testis.

One patient each with epidermoid carcinoma of the larynx, epidermoid carcinoma of the esophagus and adenocarcinoma of the rectum showed no objective improvement.

The remaining ten patients had either a moderately favorable response (slight tumor regression with symptomatic improvement) or could not be evaluated with respect to tumor response.

The patient with embryonal cell carcinoma of the testis had two large metastatic lesions in the lungs, one of which was treated with 5-fluoro-uracil plus x-ray, the other with x-ray alone. X-ray films of the chest showed no response of the lesions to 5-fluoro-uracil alone, slight regression when treated with 2,000 r. alone, and complete disappearance with the simultaneous use of both forms of therapy. (See Figure 1.)

CONCLUSION

The concurrent administration of 5-fluoro-uracil and local radiation produced a greater degree and higher incidence of tumor regression than has been reported with either mode of therapy given alone. The effects observed in this study also exceeded those expected on the basis of adding together the separate responses obtainable by either mode of therapy. Thus, true antitumor synergism appears to exist in this form of combined therapy. More extensive study of this method of cancer therapy is indicated.

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ADDENDUM: In a separate study, conducted by one of the authors (B.H.) an additional 75 patients with malignant disease have been treated with varying doses of 5-fluoro-uracil and x-irradiation. The results in this study have been similar to those reported here.

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When to Operate?

"One should operate only when there are several chances of success; to operate without a chance, means to prostitute the exalted art and science of surgery, and make it dubious in the minds of the laity and colleagues. But where is the measure according to which the chance of success can be gauged? It lies in the untiring study of our science, in the acute criticism of our own observation as well as the observation of others, in the minutest examination of each case and in the critical evaluation of our experiences."—*Theodor Billroth (1829-94).*

From Briefe von Theodor Billroth, ed. by Fischer, 1895

Ischiectomy for Pressure Sores

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and JOHN ALDES, *M.D.*, Los Angeles

• **Ischiectomy with primary closure was carried out in five paraplegic patients with pressure sores. This operation, less extensive than the wide excision with full thickness graft that is now widely advocated, was successful in four of the five cases. In the fifth case none of the several attempts to heal the sores was in the least successful.**

A WIDELY ADVOCATED TREATMENT for ischial pressure sores that are not adequately controlled by conservative treatment is excision of the ulcer and any sinus tract, removal of the ischial tuberosity or underlying bony prominence,[6,10,11] then full thickness pedicle graft to cover the defect.[4,5]

The purpose of the present communication is to review the development of the rationale for this treatment and to report results obtained by the authors with less extensive operative procedures.

Ischial ulcers, in general, are characterized by a small surface opening with a large cavity beneath, while sacral ulcers are usually large and flat with little undermining of the edges.

The first reported attempt at surgical closure of a pressure sore was by Lamon and Alexander[9] in 1945. They carried out secondary closures. Since then the literature has grown rapidly with new surgical and plastic techniques, but the incidence of break-down or recurrence was high until 1947, when Kostrubala and Greeley[7] advocated radical removal of bony prominences underlying the ulcers and subsequent shifting of adequate skin flaps. Two years later they recommended radical removal of the ischial tuberosity.[8] In 1950, Cannon[3] advocated that, if ischiectomy was done for a pressure sore on one side, prophylactic ischiectomy be done on the other side whether there was a sore there or not. Comarr and Bors[4] reported an excellent degree of success with ischiectomy and skin grafting in their large series.

As the surgical and plastic techniques are refined, the incidence of success seems to rise higher and higher. Also, the safety afforded by antibiotics with regard to operations in the usually contaminated areas about pressure sores has contributed in great measure to the efficacy of surgical treatment.

In the following five cases the operative procedures used for healing of pressure sores were less elaborate than those now widely recommended:

CASE 1. A 39-year-old man, paralyzed from the eighth thoracic vertebra for 16 years, had bilateral pressure sores of 18 months' duration. Ischiectomy with split thickness graft was done on the left, and a year later ischiectomy with relaxing incisions and primary closure was carried out on the right. The patient had had no recurrence two years after the first operation and a year after the second.

CASE 2. A 45-year-old patient with seven years of paralysis from multiple sclerosis had pressure sores of a year's duration, and bilateral ischiectomy with primary closure was carried out. A large sacral pressure sore developed a few months later. A sliding graft was applied and it took well. Four months afterward another pressure sore, in the presacral area, was excised and primary closure was done. The wound broke down, and two weeks later coccygectomy and partial sacralectomy (four bodies) were carried out. Within the next six months of observation, there was no recurrence at any of the operative sites.

CASE 3. A 51-year-old man with ependymoma of the cauda equina had an ulcer over the right ischium of two years' duration. It was excised and covered with a double pedicle flap. After two years, ulceration recurred at the same site, and it was excised, with primary closure, but promptly broke down again. A diagnosis of osteomyelitis of the right ischium was made. Secondary closure was carried out but the wound broke down again four months after the operation.

CASE 4. A 46-year-old patient, paralyzed by chordotomy for pain following disarticulation of the left hip, had a sacral pressure sore that had begun five years previously with a pimple on the left buttock, which developed into a sinus tract. Repeated operations, including saucerization of the ischial bone, were carried out. Osteomyelitis developed at the site and a sinus drained continuously. Left

From the Department of Surgery, Cedars of Lebanon Hospital, Los Angeles 29.
Submitted May 26, 1960.

ischiectomy with primary closure was done. Two years later there had been no recurrence.

CASE 5. The patient, a 50-year-old man paralyzed from the tenth thoracic vertebra since laminectomy for hemangioma of the spinal cord two years earlier, had an ulcer over the right ischium of six months' duration. Conservative treatment—keeping the patient prone most of the day and night and application of Varidase® (streptokinase-streptodornase) and Neosporin® ointment (polymyxin B, bacitracin-neomycin)—was unavailing. Right ischiectomy, undermining the edges of the lesion, and primary closure were carried out. There was no recurrence.

RESULTS

Although the operative procedures were not as extensive as those advocated in the recent literature —primary closure was used, rather than full thickness grafts—in four of the five cases the results were gratifying. There was no recurrence at the previously affected sites. In one patient (Case 3) no procedure used to date has been successful.

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Cineradiographic Studies of the Normal Cervical Spine

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• **By considering the cervical spine as several segments with relatively different motions, an understanding of the total possible motions of the cervical spine can be more easily attained.**

Reversal of the cervical lordosis is a normal part of the flexion action and can result from positioning of the patient for radiographic studies.

The effect of standing or sitting postures, and methods of initiating flexion of the neck should be considered in the evaluation of routine flexion and extension studies.

Evaluation of individual cervical segments may be accomplished by the use of different methods of initiating flexion.

APPLICATION of cineradiographic methods to studies of the motion of the cervical spine has supplied information for detailed evaluation and review of the movements of the various joints involved.

General considerations: The function of the cervical spine utilizes a complex combination of motions. By studies of the cervical spine segment by segment, each of which has certain motions, it can be seen that the total possible motion of the cervical spine entails an interrelation of individual segmental motions.

The cervical spine consists of five segments showing the "usual" motions, and two transitional vertebrae (the first and the seventh) which may share the motion of the other cervical vertebrae but may also show motion corresponding to that of the next adjoining area. Thus, in the atlas, motion may be observed corresponding to that of the axis, or it may function independently, its motion resembling that of the occiput. It thus simulates a washer or bearing between the skull and the spine, its motion corresponding more closely to that of the skull than to that of other cervical segments. The seventh cervical vertebra shows less motion than the other cervical vertebrae and thus acts more like the thoracic vertebra. If the seventh vertebra becomes sufficiently fixed by disease, by cervical ribs or by long transverse processes, the sixth cervical vertebra may assume its function. The actions of the atlas, however, are sufficiently specialized so that its function cannot be satisfactorily assumed by the other cervical segments. This is particularly true of rotation.

From the standpoint of function, the central cervical segments, the second to the sixth, may be subdivided into *upper* (the second and third), *mid* (the fourth and fifth) and *lower* (the sixth) segments. In such a subdivision the next subjacent intervertebral disc is considered as part of that segment. In a healthy adult the midcervical segment is considered the most active. It has been generally accepted as fact that motion at the fourth and fifth cervical vertebrae (including the disc between the fifth and sixth) is greater than in other portions of the cervical spine. The increased function here has been considered the cause for early development of degenerative changes at this point. The lower cervical segment and the upper cervical segment are approximately equal in function. The difference in mobility between the cervical segments is more apparent in flexion than in extension—that is, the curve of the cervical spine in full extension is smoother than the curve when the spine is in flexion. In flexion, posterior bowing is most pronounced at the midcervical segment, with this segment developing a reversed lordosis when produced by causes other than disease of the spine.

Buetti-Baüml[1] studied the motions of the cervical spine from angles formed by lines drawn along the posterior aspects of vertebral bodies examined in the flexed and extended attitudes. The postulations as to segmental mobility described in the preceding paragraphs agree with his data. In the present study, in order to duplicate the muscle action in the group studied, it became evident that the following factors had to be controlled.

Position: The first group of patients had routine static films in a sitting position but cineradiographs were obtained with the patient in a standing position. The next group of patients, therefore, was studied in both sitting and standing positions by routine films and cineradiographs. Review of the static films showed that in the standing position the amount of extension was reduced and flexion appeared to occur at a lower level. Thus, when standing, the amount of posterior bowing of the midcervical segment produced by flexion was less pro-

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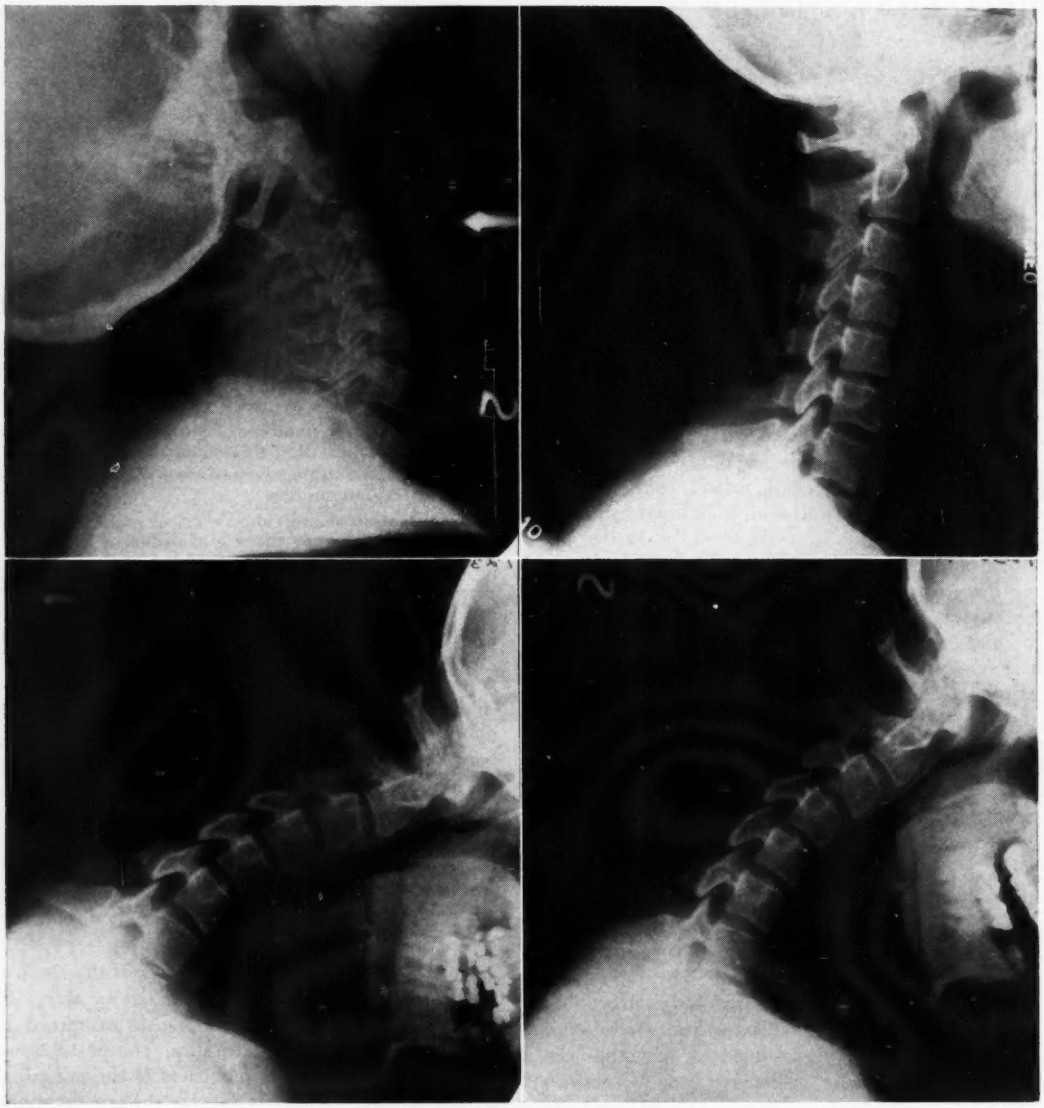

Figure 1.—Flexion and extension studies in a normal 30-year-old woman. *Upper left,* cervical spine in controlled extension. *Upper right,* cervical spine in neutral standing position. *Lower left,* cervical spine in controlled flexion, using chin-motion 1 (described in this article). *Lower right,* cervical spine in controlled flexion, using chin-motion 2.

nounced than when sitting. The degree of glide between the vertebral bodies was also curtailed in the standing position, particularly in extension. This differential motion was more easily demonstrated on the static films than on the cineradiographs but, until appreciated, made correlation between the static and moving films difficult in some cases.

Method of initiating flexion: Comparison between two sets of films made on the same person on the same day showed, in the two instances, a different curve of the cervical spine. In the first study the neck had been flexed and the chin then pulled in, whereas on the second set of films, the chin had been pulled in first, and the neck then flexed. A series of patients were examined in which the patient first flexed the neck without moving the shoulders, and with the head semi-extended. When the maximum range of such motion was attained, the chin was pulled in. This will be referred to hereafter as chin-motion 1. Films were next made with the patient's chin pulled in to the greatest extent, and the neck flexed to the maximum (chin-

motion 2). These studies were made in both standing and sitting positions.

The effect of the two different head motions (Figure 1) was to produce an accentuation of the midcervical reversed lordosis when chin-motion 2 was used. With chin-motion 1, greater flexion in the lower cervical segment and less reversal of the normal midcervical lordosis was observed. On the cineradiographs it was seen that chin-motion 1 caused the head to go into relative extension, straightened the midcervical lordosis and resulted in early flexion at the cervicothoracic junction. As flexion continued, there was gradual development of the expected reversed lordosis in the midcervical segment. This lordosis, however, became pronounced only after the chin had been fully drawn in.

With chin-motion 2, the first change was that of backward motion of the lower cervical segment, which produced straightening of the lordosis at this level, and a forward movement of the upper segment. By forcibly pulling in the chin, it was possible to produce a sharp posterior angulation of the midcervical segment. As the flexion action continued, the lordotic reversal in the lower cervical segment progressed and the sharp angulation lessened. The total flexion in the lower cervical segment with this particular motion was less than that seen with chin-motion 1.

When chin-motion 1 was used to produce flexion in the sitting position, the curve which the spine developed approximated that seen in the films taken in standing position. A greater reversal of the lordosis still occurred, however, in the sitting position.

By utilizing these various motions, it is possible to study almost selectively the potential motion of the individual cervical segments.

Specific consideration: As a patient ages, there is general reduction in the segmental and total motion of the cervical spine. If focal degenerative changes are present, one segment may lose its major action and other segments assume its function. In childhood, the upper cervical segment is more active because of the position of the scapula and clavicle. As these bones descend, the midcervical segment assumes the greatest action. Later the motion once more becomes proportionately greater at the higher levels as decreased function from degeneration affects the mobility of the midcervical segment. The total motion pattern of the cervical spine of any one person is rather characteristic of that person. This is reflected in the varying forms of the spinous processes, the shaping of vertebral bodies and the varying muscular development. Thus, there is no one average motion that can be ascribed to the cervical spine but rather a range of normal motions. In one person, elongated transverse processes of the seventh cervical vertebra caused restriction of the flexion action in the lower cervical segment when studied in the standing position. This restriction was not as apparent in the sitting position. Such elongated processes may require the same consideration applied to a transitional lumbosacral vertebra.

INDIVIDUAL JOINT MOTION

In his report on cineradiographic studies of the cervical spine, Fielding[2] described in detail the various motions possible. Only a brief résumé of such motions will be given here.

Occipito-atloid: Only flexion and extension are observed at this joint. The degree of these motions as related to total cervical spine motion depends upon the position in which the head is held. The motion occurs independently or in combination with atlanto-axial motion. Evaluation of this joint can be accomplished by observing a nod motion with rather strong extension component. The posterior arch of the atlas can be observed in some persons to nestle in the impression on the occipital bone when the head is fully extended.

Atlanto-axial: This joint allows most of the rotation of the head, other cervical segments coming into action only in extreme rotation. Flexion and extension can be observed separately or in conjunction with occipito-atloid motion, as in the nod. In extension and flexion the anterior arch of the atlas can be observed to move up and down on the dens. Fielding reported a telescoping action of the atlas on the dens during rotation owing to the comparative form of the articulating facets. This action was not observed in the present study but may not have been adequately demonstrated.

The importance of the transverse ligament-dens relationship was observed in three patients with congenital fracture of the odontoid. In these patients, a reverse curve of the midcervical segment could not be produced in extreme flexion. Flexion of the head occurred almost entirely in the atlantal-axial joint with only a straightening of the midcervical lordosis.

General cervical motion—zygapophyseal: During flexion from the neutral position, the zygapophyseal joints showed the greatest change. This variation occurred when the intervertebral discs were undergoing alteration in shape, the change being from that of a wedge with its greatest width anteriorly, to a parallel form. The fulcrum of motion at this time appeared to be shifting from a point approximately at or slightly behind the posterior aspect of the vertebral body, to a point approximately at the midpoint of the body. As flexion continued, upward and forward glide of the zygapophyseal joints was

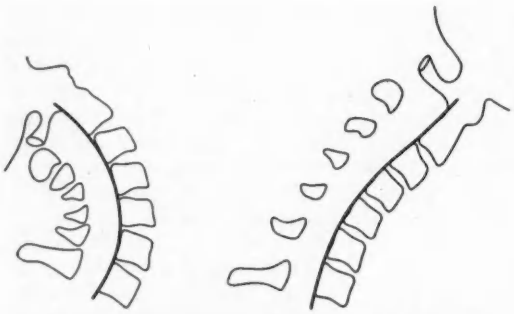

Figure 2.—Diagram of cervical spine in flexion and extension. A smooth curve is produced along the posterior aspects of the vertebral bodies in extension. The curve traced along the posterior aspect of the vertebral bodies when the neck is flexed shows the form of a bow rather than an arc. This reflects the varying degree of participation of the cervical segments in the flexion action.

observed until there was only minimal apposition of the superior surface of the inferior facet with the inferior surface of the superior facet. The second and third cervical facets, which tend to be smaller and asymmetric, showed less pronounced motion in adults. At the extreme of flexion, the facets tended to be angled on each other. This allowed the spinous processes to spread. Widening of the superior segment of the zygapophyseal joints was produced by continued extension after the maximum range of downward glide was reached.

Intervertebral discs: The intervertebral discs showed two motions during flexion—anterior glide of one vertebral body on the adjoining body, and change in shape of the intervertebral disc. As the head moved from the neutral to flexed position, the anterior height of the intervertebral disc decreased and the posterior vertical dimension widened. The forward glide developed later in the course of the flexion. The combination of these two actions resulted in a rocking motion. The overriding of the anterior inferior margin of one vertebral body on the anterior superior surface of the next inferior body would account for the frequently seen notch or irregularity of the inferior body. In maximum flexion, the discs in the midcervical segment were wider in the posterior than in the anterior dimension. This was more evident and constant in the midcervical segment. This difference in mobility produced a curve along the posterior surfaces of the vertebral bodies which was smooth but shaped like a bow rather than a semi-circle (Figure 2).

As extension occurred, there was downward and posterior glide of the zygapophyseal joints until the impingement of the spinous processes limited further extension. If extension was forced after the zygapophyseal joints completed maximum slide, further opening of the discs appeared. This resulted from some further leverage of the discs, with the zygapophyseal joints acting as the fulcrum.

Combined motion: The cervical spine actually functions by combinations of the above motions. When a patient suffering from pain in the cervical area places his head in the position accentuating pain, he tends to swing the head in circles. Cineradiographs recorded during this motion demonstrate a combined flexion-extension and rotary motion with upward and forward glide of the zygapophyseal joints of one side, and a downward and backward glide of the opposite side. The changes of the discs observed in flexion and extension can be observed at the same time. Side-to-side bending is limited in the cervical area; thus, narrowing of the lateral margins of the discs is not as pronounced a phenomenon.

Equipment used: A commercial model Westinghouse Cine Fluorex unit was used in all these studies. Radiation exposure was measured at the skin surface by means of a Victoreen rate meter, and for an average person measured approximately 3.4 roentgens per minute in the central beam. This was delivered to an area measuring approximately 5 by 5 inches with the field defined by the lead shutter of the unit. The total duration of exposure for the average patient was approximately four minutes. Since the equipment used will not measure a rate of less than six milliroentgens per minute, male gonadal exposure rate was not measurable.

COMMENT

Cineradiography permits the study of diseases of the spine which relate to abnormal function as well as to anatomic distortion. The spine can be evaluated in a more physiologic manner. In addition, patients who for physical reasons are unable to maintain proper position for static film study can be examined by this method. Those positions and movements which produce symptomatology can be recorded as they occur, and evaluated as to underlying disturbance.

To date 80 examinations of the kind herein described have been conducted. Flexion and extension studies with routine methods were also obtained in most of these patients.

Various diseases affecting the cervical spine have been studied and will be reported subsequently.

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Trimalleolar Fractures

A Convenient Medial Approach for Surgical Reduction

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• **In dealing surgically with trimalleolar fracture of the ankle joint in which the comminution is not severe, the medial approach is convenient and practicable. In the process of reducing the fracture the alignment can be directly observed. The fixation of the posterior fragment is done from the front rather than from the back of the tibia. Removal of the screws used for fixation is made considerably easier.**

TRIMALLEOLAR FRACTURES are among the most serious of injuries to the ankle. By definition, the injury involves both medial and lateral malleoli and either the anterior or the posterior buttress of the tibia. As preface to a discussion of the indications for surgical treatment and a description of a method of approach that is simpler and easier than others that are in common use, a review of the anatomical structure may be helpful.

The ankle is a joint of saddle type, with the talus well protected by bony buttresses on both sides. Ligamentous support of the ankle joint is unusually good. The medial and lateral ligaments about the ankle joint—for example, the deltoid on the medial side—may be thought of as consisting of three major sections. They are the central section, which extends from the medial malleolus to the os calcis (the tibiocalcaneal), and the anterior and posterior section which are both attached to the talus ligaments. Similarly divided are the ligaments about the lateral side of the joint. Broadly, there is a large central section which may be called the fibulocalcaneal ligament, and anterior and posterior to this section are the talofibular ligaments. The tibiofibular ligaments hold the tibia and fibula together close to the ankle joint and constitute support so strong that stress strong enough to fracture either the medial or lateral malleolus or both nearly always damages the ligaments also. Often if there is great vertical stress, either the posterior portion of the tibial saddle or the anterior portion of the tibial saddle is fractured off. With the stabilizing structures thus removed, dislocations occur.

Of principal concern in considering operation are the degree of instability and the degree of comminution: Is operation warranted, and, if it is, can the anatomical structure be improved. Since both malleoli are fractured in so many cases, let us consider this as the usual occurrence, the decision as to whether to operate then resting on the degree of stability of the ankle joint. If the joint is dislocated and it is observed on reducing the fracture that the ankle mortis is not stable and that the fracture easily redislocates, then it is usually necessary to provide internal stability. In general, when approximately one-quarter or more of either the anterior or posterior weight-bearing surface of the joint is involved, the instability is severe enough to necessitate such a procedure. In those circumstances, open reduction is the treatment of choice. Sometimes, usually in elderly patients, there is so much comminution of the lower end of the tibia that joining the pieces together well enough to provide a good ankle joint would be impossible. In such cases the same rules that apply to treatment of comminuted wrist fractures in the elderly should apply.

Although most of the reports in the current literature recommend a posterior or posterolateral approach for dealing with a posterior fractured fragment of the tibia, a medial approach such as is used for medial malleolar fractures is easier and serves quite as well. Indeed I consider the medial "J"-type of incision just behind the medial malleolus and extending upward about three or four inches and forward below the malleolus far enough so that the flap can be pulled forward in front of the medial malleolus, to be the approach of choice. Abrasion of the skin at that site is a contraindication, but not an absolute one if operation is being done soon after injury.

Once the fracture site has been opened and the medial malleolar fracture is displaced merely by pulling on the foot, the talus can be pulled away from the tibial articulation, permitting inspection of the degree of damage to the joint cartilage. It is also possible to see how much of the joint surface is involved in the fracture site. Reduction of the posterior or anterior fragments can then be accomplished, while traction is being applied, by pushing the posterior fragment down until the joint surfaces are aligned. Occasionally small pieces of bone that have become wedged in

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the fissure have to be removed before the main fragment can be seated firmly. Although it may not hold quite as well, a screw placed from the anterior to the posterior is adequate and so much easier than putting it through from the back to the front that I consider it the method of choice for holding this particular fracture. After a hole of suitable gauge has been drilled through the fragment and the intact bone, a screw long enough to span the full diameter of the lower end of the tibia is placed. Occasionally it is necessary to place two screws to hold the pieces together. With this done, the reduction of the dislocation should be relatively easy to maintain and, when relaxed, the ankle joint should be quite stable. It is then possible to deal with the medial malleolus. As a general rule, nothing need be done to the lateral malleolus, since after the medial malleolus is reduced, the talus can be held firmly against it as a buttress. After the medial malleolus has been reduced, a screw may be used to hold the fragment in place, but as a general rule I prefer merely to place a large Kirschner wire or small Steinmann pin through the medial malleolus to hold it solidly in alignment with the tibia. Once this has been done, the ankle can be treated in a manner similar to that usually used for a Pott's fracture. The wound is closed in the normal anatomical fashion, dry dressings are applied, and a long leg cast, with the knee flexed to 45 degrees and the foot at approximately 90 degrees, is used for immobilization. It is usually desirable to place the foot in some inversion in order to maintain contact between the talus and the malleolus. In this position, the lateral malleolus and the lower end of the fibula will usually reduce quite well. Good results are obtainable if this method is done early, before connective or scar tissue forms between the tibia and the fibula.

DISCUSSION

The advantages of the approach described for the treatment of the posterior fragment, as well as the anterior fragment of the tibia, can be best appreciated when the time comes for the removal of some of the hardware. Usually this is done between two and six months after the patient is permitted to resume weight-bearing.

Nearly all observers agree that anterior fragments should be fastened with a screw placed through the anterior fragment into the posterior main shaft of the tibia. The screw so placed can be removed quite easily by making a short incision, under local anesthesia, directly over the head of the screw. It was the ease of reduction of this anterior fragment that led to the procedure herein described for extending the usefulness of this method to the posterior fragment. It has been used for more than ten years with good results.

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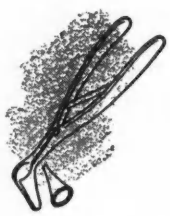

Efforts to Control Antibiotic Resistant Infections

A Coordinated Community Effort

EDWARD LEE RUSSELL, M.D., Santa Ana

• **Since June 1958 the medical society, the medical institutions and the medical professions in Orange County have conducted an intensive program to control and prevent the spread of antibiotic resistant infections.**

In this community-wide effort, rules designed to protect the hospital population against infectious dangers have been developed and enforced, courses in food-handling and housekeeping sanitation have been given to hospital employees, and a program to solve some of the laboratory aspects of antibiotic resistant infections has been developed.

RESISTANCE of organisms to the commonly used antibiotics has spread from gram-positive cocci, such as the staphylococcus aureus, to gram-negative bacilli, such as E. coli and Pseudomonas aeruginosa.[2] The phenomenon has become increasingly familiar to physicians and hospital administrators in all civilized countries.

The voluminous literature on these dramatic, and at times tragic, changes in the ecology of infectious diseases has aroused all medical disciplines to a vigorous concern.

Surgeons, pathologists, microbiologists, obstetricians, pediatricians and the general physicians are the ones who most frequently see staphylococcal disease first hand, but no medical specialty is exempt, including the public health physician. On several occasions within the author's knowledge, a psychiatrist has been called in to deal with the mental depression and hopelessness that have led patients with such infections to consider suicide.

There is reason to believe that the knowledge and skills of the professional epidemiologist have not been used enough. An infection which involves not only the patient and the institution where he is currently housed, but also the patient's family and the community, cannot be looked upon as an isolated phenomenon such as, say, a ruptured appendix.

The insidious nature of staphylococcal disease has caused the medical professions to be slow to realize the magnitude and the gravity of the ecologic changes that have taken place.

HEALTH AUTHORITIES AROUSED

On October 10, 1958,[3] the California Conference of Local Health Officers, by resolution, formally recognized antimicrobial resistant infections as "a serious problem to the population of California" and outlined "the responsibilities of local health departments in the prevention and control of hospital acquired staphylococcal infections."

Among the areas of responsibility outlined in the resolution were to:

1. "Investigate and report on incidence and prevalence through the following possible devices: Laboratory reports, telephone surveys, postcard surveys and public health nursing visits.

2. "Promote the active participation of local hospitals and medical organizations in the prevention and control of hospital infections and coordinate these activities in a community-wide program.

3. "Extend public health laboratory services, as possible, to obtain more adequate identification of staphylococcal infections.

4. "Develop in-service staff orientation, education, and training for health department personnel and offer assistance in these programs for all levels of hospital personnel.

5. "Develop for the local health department (and encourage local hospitals to develop for each hospital) written manuals of agency policies and procedures for the prevention and control of staphylococcal infections.

6. "Provide, or obtain, technical and administrative consultation to all hospital services, committees and physicians in the community. Conduct inspections and enforce special regulations if required by local conditions."

In this succinct statement the Conference of Local Health Officers stated the problem and defined the responsibilities and relationships which, if followed, should have accomplished the maximum results within the shortest time.

However, there is even now, long after the resolution was passed, reason to doubt if many health departments in California have made acceptable progress toward establishing a well-coordinated community program for the control of antimicrobial resistant infections.

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An open poll might prove embarrassing to all of us. But a quick comparison with the experience of one county (Orange) may permit other health departments to grade their own efforts. Orange County's experience is as follows:

1. Surveillance

In the *telephone survey*, a 10 per cent sample of newborn infants and their mothers proved to be too small. Also the survey involved too large a commitment of personnel time and was too retrospective to be of immediate value. After one year, it was discontinued.

Postcard surveys were attempted on a small scale by the infections committees in some hospitals but were weighted too heavily toward those who had complaints, and they failed for lack of consistent patient and physician cooperation. These surveys were discontinued after as little as a few weeks to as much as several months.

Laboratory reports of coagulase-positive staphylococcus cultures to a central agency (the health department) provide a sensitive index of the fluctuations of the infection in the community. However, the commitment of the health department's statistical skills to the telephone survey resulted in inadequate use of this epidemiological tool. These were discontinued after 18 months.

Public health nursing visits, complaints of patients and informal *physician reports* are now the principal sources of information in Orange County. Naturally, these reports indicate only the continued existence of the infections problem and not its magnitude.

2. Coordination of Community Effort

Through the county-wide Infections Control Committee, manned by various medical disciplines and appointed by the county medical association, a significant degree of coordination of effort has been achieved in Orange County. Representatives of other disciplines served as consultants.

Uniformity of practice, such as the regulation of visiting to hospitals; exchanges of information, on such things as the effectiveness of various commercial disinfectant preparations; review of educational materials, such as units of instruction for hospital employees, films; and the over-all strategy of the effort are accepted functions of this area-wide committee.

Most important to the success of this area-wide committee was that an administrative outline was prepared, and accepted, at the outset. It seemed essential that responsibilities and relationships of the various professional and institutional interests be clarified at the start.

Next in importance to acceptance of the administrative outline was that the committee recognized and accepted its limitations. The committee realized that its duty was to support, but not to usurp, the responsibilities of the hospital infections committees.

The Orange County Infections Control Committee has met on an average of every six or seven weeks since it was established in June 1958.

3. Laboratory Support

Another function of this area-wide Infections Control Committee was, through a subcommittee of laboratory personnel, to initiate laboratory studies designed to follow the natural history of antibiotic resistance and to find ways of solving laboratory problems through the coordinated efforts of the various laboratories.

An example of this coordination of laboratory effort is a current study of the value of the various disc methods for determining organism sensitivity to antibiotics, compared with the (1) tube dilution and the (2) Pepper Laboratory replicating methods. This study resulted from the observation by clinicians that the antibiotic sensitivity pattern indicated by the discs is not always confirmed by the patients' responses to the administration of the antibiotic that the discs indicate is effective.

Steers[4] of Philadelphia, in a recent personal communication, said, "It has come to my attention that discs from different manufacturers may vary from no trace of a stated drug per disc to as much as 2000 per cent."

As a consequence, the Division of Laboratories in the Orange County Health Department is preparing to do comparative antibiograms against test organisms, using concentrations of the drugs not to exceed the maximum obtainable concentration of a given drug in a patient's circulating blood. Hospital and private laboratories are to do routine antibiograms, as usual; the validation of disc concentrations will be done by the health department laboratory.

4. In-service Training Programs

Walter[5] showed conclusively that environmental sepsis in the hospital is the result of the activities of everyone within the hospital walls, not the professional personnel alone. The maid, the orderly, the maintenance man, the laundry helper, and all the rest, can either assist in the control and elimination of hospital sepsis, or, by ineptitude or negligence, perpetuate a septic environment.

In order to bridge the gaps in the training of subprofessional personnel, the county-wide Infections Control Committee directed that training courses be set up for these employees as soon as possible.

Since food handling courses for restaurant workers were already in operation, it was easy to begin classes for hospital food handling personnel imme-

diately. In addition, training outlines and visual aids have been prepared for housekeeping and maintenance employees and for laundry personnel.

The food handler courses were preceded by a detailed survey of the conditions in each hospital kitchen and food service area. In most hospitals the conditions were shocking.

Owing to the size of hospital maintenance staffs and the high turnover in hospital help it is anticipated that the courses will have to be repeated frequently. Should the teaching staff ever catch up with the hospital job, they will move into convalescent and nursing homes where antibiotic resistant infections are even more prevalent than in general hospitals.

5. Policies and Procedures Manuals

Due in large part to the encouragement of the county-wide Infections Control Committee, eight of Orange County's 14 hospitals have now completed and filed with the committee their revised policies and procedures manuals for the control of infections.

6. Consultations

With the assistance of the State Department of Public Health, technical consultation on the operation of maternity and newborn nursery services is provided by the Maternal and Child Health and the Public Health Nursing divisions of the Health Department. This is not new, but it fits readily into the pattern of support which is approved by the Infections Control Committee.

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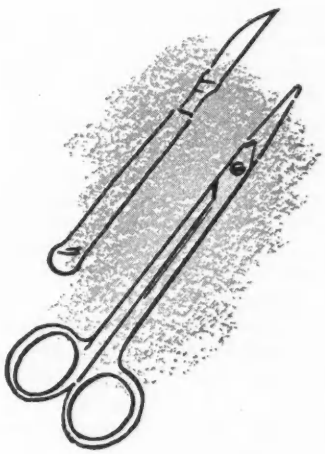

Maternal and Perinatal Deaths in California

THEODORE A. MONTGOMERY, *M.D., M.P.H.*, and ARLINE LEWIS, *M.P.H.*, Berkeley

• **In a 29-month period, 151 of 373 deaths of California women occurring during or within 90 days of termination of pregnancy were studied jointly by the California Medical Association and the California State Department of Public Health. Twenty-two per cent of the deaths reviewed were considered unavoidable. In 74 per cent, one or more avoidable factors were identified. Avoidable factors could not be identified in 4 per cent of the cases.**

Thirty-three per cent of the cases considered to have avoidable factors were attributed to be solely the responsibility of the attending physician. Inadequate hospital facilities were held responsible in less than 1 per cent of deaths, while responsibility in 26 per cent of the deaths was laid directly to patient error or refusal. In 40 per cent of the avoidable deaths, more than one avoidable factor was identified.

Nonobstetric conditions accounted for the greatest proportion of the deaths, followed by hemorrhage, toxemia of pregnancy, sepsis, abortion and ectopic pregnancy.

The findings of this study compare closely with those of similar studies in other states, including Minnesota and Massachusetts.

ALTHOUGH California's maternal mortality rate has steadily declined and in 1958 reached the lowest point thus far in its history, the California Medical Association and the State Department of Public Health feel that this rate can be reduced even further. In 1920, the California maternal mortality rate was 70.5 per 10,000 live births. This rate has fallen to 2.9 per 10,000 live births in 1958, or 103 resident maternal deaths for that year. Perinatal mortality rates have also declined but the rate in 1958 was slightly higher than in 1957, reflecting the increase in neonatal mortality for that year.

Initial steps to study causes for maternal and perinatal deaths were taken more than three years ago by the California Medical Association. It established the Committee on Maternal and Child Care to plan and direct continuous statewide studies of maternal and perinatal deaths. The membership of the committee includes obstetricians, pediatricians, general physicians, a pathologist, an anesthesiologist and a public health physician. Through this committee, the C.M.A. has joined forces with the State Department of Public Health to review all maternal and certain perinatal deaths occurring in California so that causes of death and avoidable factors can be identified. This study is equally financed by the California Medical Association and the State Department of Public Health.

Thus far the Committee on Maternal and Child Care has concentrated on the problem of maternal mortality. In these studies, for the purpose of identifying cases, a maternal death is considered to be one that occurs during or within 90 days after the termination of pregnancy.*

Four regional maternal mortality review committees were formed to begin with, and later a fifth committee was added because of geographical problems encountered. Each of these five committees has a chairman, appointed by the state committee, who is responsible for selecting members of the regional committee (with approval of the state committee), for assigning cases to special consultants, for calling meetings of the committee and for over-all administration of the maternal mortality studies for the region. The regional committee, like the state committee, has broad representation. It consists of obstetricians, general physicians, a pathologist, an anesthesiologist and a public health physician.

Qualified obstetricians in private practice in each of the five regions are appointed as special consultants in obstetrics by the State Department of Public Health on the recommendation of the regional chairman. These consultants, who are reimbursed for their services by the State Department of Public Health, are given responsibility for reviewing hospital records, coroners' reports and other records, as well as for interviewing attending physicians to obtain detailed information regarding each case under consideration by the regional committee.

Evaluation of each maternal death is on a completely voluntary basis. That is, before a case record is reviewed, the committee must have the attending physician's permission to include it in the statewide study. When information regarding a sufficient number of cases (usually 10 or 15) has been abstracted

From the Bureau of Maternal and Child Health, California State Department of Public Health, 2151 Berkeley Way, Berkeley 4.

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Submitted June 27, 1960.

*This definition is unlike that used in compiling official maternal death data. In calculating official maternal death statistics, a maternal death is one in which the underlying cause of death can be assigned to the category labeled Deliveries and Complications of Pregnancy, Childbirth and the Puerperium, according to codes (640-689) in the Seventh Revision of the International Statistical Classification of Cause of Death.

by the special consultants in a region, the chairman of the regional committee calls a meeting of his committee. The consultant presents data on the cases to the committee, which then attempts to determine: (1) What was the cause of death; (2) whether or not the committee will accept as fact the stated cause of death on the death certificate; (3) whether or not pregnancy and labor were related to the death; and (4) what avoidable factors, if any, were present.

In evaluating maternal deaths for avoidable factors, several assumptions are made: (1) The attending physician possesses all the knowledge currently available related to the factors involved in the death; (2) by experience he has reached a high level of technical ability; and (3) he has available to him all the facilities present in a well organized and properly equipped hospital. Consideration is also given to how well the patient followed the physician's advice, if, indeed, she sought medical care at all.

Special forms for recording pertinent information obtained by the obstetrical consultant have been developed. These forms are designed so that they do not disclose the identity of the patient, the hospital or the attending physician. As a further safeguard, the State Legislature passed a bill in 1959 (Assembly Bill 595) which was approved by the Governor, adding Section 211.5 to the Health and Safety Code, providing for the confidentiality of all records insofar as the identity of the individual patient is concerned. Section 211.5 states that "All records of interviews, written reports and statements procured by the state department or by any other person, agency or organization acting jointly with the state department, in connection with special morbidity and mortality studies shall be confidential insofar as the identity of the individual patient is concerned and shall be used solely for the purposes of the study. The furnishing of such information to the state department or its authorized representative, or to any other cooperating individual, agency or organization in any such a special study, shall not subject any person, hospital, sanatorium, rest home, nursing home, or other organization furnishing such information to any action for damages. . . . Nothing in this section shall prohibit the publishing by the state department of statistical compilations relating to morbidity and mortality studies which do not identify individual cases and sources of information or religious affiliations."

Local health departments participate in these studies in a number of ways. At least one member of each regional committee represents the medical staff of a local health department. In addition, full-time local health departments are responsible for identifying all maternal deaths in their area. Copies of all death certificates filed with the local health officer mentioning factors related to pregnancy are sent directly to the chairman of the regional committee. Certificates of maternal deaths filed in the areas having part-time health officers or in the counties contracting with the State Department of Public Health for public health services are sent to the regional chairmen by the State Department of Public Health. In this way regional committee chairmen are promptly notified of maternal deaths. Individual local health officers are also invited periodically by the regional committee chairmen to take part in the committee discussions. In certain cases, particularly those involving public maternity care, the local health officer has a responsibility to assist in initiating such changes in public obstetrical care as the maternal death studies indicate are needed.

Considerable time was required to plan the procedures for studying each of the deaths. In August 1957 a tentative plan was tried out. The trial provided valuable experience; after a number of changes in procedures and in record forms, the present study got under way January 1, 1959. Limited data are available on all cases studied between August 1957 and December 31, 1959. During that period, 373 death certificates indicating a maternal death were filed in California. An exact count of the number of deaths occurring in pregnant women or within 90 days of termination of pregnancy is not available. If pregnancy or a condition associated with pregnancy is not mentioned on the death certificate, the case may be missed as a maternal death. From information obtained by matching death certificates for California women aged 15 through 44 against birth certificates and fetal death certificates, it was possible to estimate that at least 25 per cent of the maternal deaths as defined in this study would be missed if only death certificate information was used to identify cases. Both because it was recognized that the regional committee would be quite busy studying the cases easily identified and because it was estimated that use of the matching techniques to identify maternal deaths which would otherwise be missed would cost twenty to twenty-five dollars per case, it was decided to forego this procedure for the time being. Moreover, in Minnesota it was found that even matching birth and death certificates is not a sure way of identifying all cases.[2] In that state additional cases have been identified by reports from practicing physicians, hospitals, nurses and newspapers.

Up to January 1 of this year, 151 of the 373 deaths had been studied by a regional review committee. Two additional deaths were not reviewed either because permission of the attending physician could not be obtained or the coroner refused to give permission for review of his records. Of the

TABLE 1.—*Selected Data from Maternal Mortality Studies in California Compared with Similar Data in Other States*

State and Year of Study	Maternal Mortality Rate*	PER CENT						
		Unavoidable	Indeterminate	Avoidable	Avoidable Factors Attributable to			
					Physician	Patient	Hospital	Combination
California 1957-1959 (151)	2.9	21.8	4.0	74.2	33.0	25.9	0.9	40.2
Iowa[3] 1953-1954 (73)	1.7	34.3	6.5	59.2				
Massachusetts[5] 1954 (55)	1.5	32.7	7.3	60.0	60.6	30.3		9.1
Minnesota[2] 1950-1954 (177)	2.8	54.3	1.1	44.6	87.3	5.1	7.6	
New Hampshire[4] 1958 (4)	4.2	25.0		75.0	66.7	33.3		
South Carolina[7] 1955 (56)	8.9	25.0		75.0	47.6	38.1	14.3	
West Virginia[1] 1958-1959 (7)	3.7	42.8		57.2	25.0			75.0

*Rate per 10,000 live births (California rate is for 1958—all other rates are for 1956-1957).

NOTE: Numbers in parentheses are the number of deaths studied.

deaths studied, 33 (22 per cent) were considered to be unavoidable; avoidable factors could not be determined for six cases (4 per cent); and 112 cases (74 per cent) were judged to have one or more avoidable factors associated with them. In 37 (33 per cent) of the avoidable cases the avoidable factors were considered by the review committees to have been solely the responsibility of the attending physician. In only one case was avoidable death attributed solely to inadequate hospital facilities. The avoidable factors were judged to have been the responsibility of the patient only in 26 per cent of the cases. Forty per cent of the avoidable deaths were attributed to more than one factor.

Examples of the role physicians played in these maternal deaths include the following:

1. Poor timing of a surgical procedure.
2. Failure to take appropriate steps to establish the diagnosis of an obstetrical complication, including failure to examine the patient and failure to obtain consultation.
3. Administration of excessive amounts of parenteral fluids.
4. Inappropriately discharging a postpartum patient who had pneumonia.
5. Failure to take steps promptly to diagnose cause of hemorrhage and, when diagnosis was finally established, failure to treat vigorously to avoid shock and death (fibrinogen deficiency).

The causes of the 151 maternal deaths studied to date by the regional review committees have been assigned to groups of causes of death which are used by the National Office of Vital Statistics. These are based on the Seventh Revision of the International Statistical Classification codes for causes of death. The numbers of deaths in these various groups (with code numbers given in parentheses) are as follows:

1. Hemorrhage (643-644, 670-672)—12 cases (8 per cent). This category includes such causes of hemorrhage as placenta praevia, abruptio placenta, retained placenta and atonic bleeding.
2. Toxemia of pregnancy (642, 685-686)—10 cases (7 per cent).
3. Sepsis (640-641, 681-682, 684)—9 cases (6 per cent). This includes genito-urinary tract infection during pregnancy, as well as puerperal sepsis.
4. Abortion (650-652)—30 cases (20 per cent). This includes spontaneous abortion and self-induced and criminally-induced abortion with and without sepsis.
5. Ectopic pregnancy (645)—8 cases (5 per cent).
6. Other maternal causes (646-649, 660, 673-680, 683, 687-689)—28 cases (18 per cent). This includes deliveries complicated by malposition of fetus, cephalopelvic disproportion, uterine inertia, lacerations, air embolism, cerebral hemorrhage in the puerperium.
7. Nonobstetric causes—53 cases (35 per cent). Includes accidental deaths, malignant disease, pneumonia, congenital malformations.
8. Cause undetermined—1 case.

Autopsy was done in 76 per cent of the 151 cases studied.

A comparison was made of selected data for the deaths studied in California concerning avoidability of death and types of avoidable factors with similar data obtained by studies done in other states (Table 1).

At a later date the Committee on Maternal and Child Care will publish more detailed reports of the data now being assembled. However, preliminary evaluation of these data shows that:

1. Although the vast majority of deliveries in California occur in hospitals (98.8 per cent), only 80 per cent of the maternal deaths occur in hospitals.
2. Nineteen per cent of the maternal deaths occurred in Negroes while 8 per cent of the live births are Negro.
3. One-fourth of the maternal deaths are in the 35-year-and-older age group, but only one-tenth of the live births in California are delivered of mothers in the 35-year-and-older age group.
4. Thirty per cent of the deaths studied occurred in undelivered women.
5. Fifty-three per cent of those who died following delivery, did so within 24 hours of delivery.

6. Thirty per cent of the women who died were known to have received no prenatal care; however, 42 per cent of these deaths were classified as resulting from abortion.

7. Of those who did obtain prenatal care and the month it was started was known, one-half started this care in the first trimester of pregnancy.

8. Although 56 per cent of the live births in California occur in private nonprofit hospitals, only 42 per cent of the 151 maternal deaths occurred in such hospitals.

Turning again to perinatal mortality, this rate in California dropped from 53.8 per 1,000 live births and fetal deaths in 1921 to 29.3 in 1957 and then rose to 29.4 in 1958. In California, the perinatal mortality rate is a figure which represents the total number of fetal deaths at 20 weeks' gestation or more plus the total number of infant deaths at less than seven days of age, divided by the total number of live births and fetal deaths at 20 weeks' gestation or more. This calculation is based on recommendations of the Public Health Conference on Records and Statistics, an advisory group to the Surgeon General of the United States Public Health Service. In recent years there have been approximately ten thousand perinatal deaths a year in California. Of these, approximately 6,000 are neonatal deaths (under one week of age). Prematurity or conditions related to prematurity are reported on death certificates to account for the greatest proportion of the neonatal deaths, followed by atelectasis, birth injuries and congenital malformations. Detailed information as to causes of fetal death is not available.

Because of the large number of infants involved, the Committee on Maternal and Child Care has concluded that studies of perinatal deaths are best done either by individual hospitals or by local medical societies, particularly in the less populated counties in California. With this in mind, the committee has encouraged local medical societies to establish their own perinatal mortality study committees. In a number of hospitals, study committees have also been formed. In addition to these local efforts, the state committee is planning to review for a limited time certain causes of perinatal death. Initially, the committee plans to study deaths associated with hemolytic disease of the newborn. This condition was picked for several reasons. First, being seventh in order of frequency as a cause of neonatal death, it accounts for approximately 200 deaths each year. This is a number that can be easily studied by the state committee. Second, on reviewing information available from all 1956 death certificates mentioning hemolytic disease of the newborn or conditions associated with this disease, it appeared that a significant proportion of these deaths, particularly those occurring 12 hours or more after birth, can be prevented. One expert in pediatric hematology[6] who reviewed the 1956 death certificate data believed that approximately 50 per cent of the infants dying of hemolytic disease of the newborn after 12 hours of life could have been saved had the mother received "ideal" prenatal care and "ideal" management of delivery and had the infant been given "optimum" treatment.

Procedures being developed by the Committee on Maternal and Child Care and the State Department of Public Health for studying these cases are similar to those used in studying maternal deaths. Special forms for recording pertinent information for committee review have been developed.

The State Department of Public Health has been given responsibility for the statistical analysis of the data obtained from both the maternal and perinatal death studies. Using the analysis of these data, the Committee on Maternal and Child Care will prepare reports periodically. Summaries of interesting cases having particular teaching value will be submitted from time to time for publication in state or local medical society publications. Of course, these reports will provide no way of identifying patients, physicians or hospitals.

In addition, deficiencies in hospital facilities will also be carefully evaluated by the committee and, where necessary, these will be reviewed with the administrative and professional staffs of the involved hospital as well as with the California Hospital Association.

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CASE REPORTS

Primary Cancer at Three Sites

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THE PURPOSE of this report is to emphasize the need for further evaluation of the patient already found to have cancer.

As a result of more intensive clinical and pathological investigation, discovery of more than one primary cancer in one person, either at the same time (synchronous) or at a later date in his increasing life-span (metachronous), is occurring more and more often. With increasing longevity, symptomatology assumes a more complex role. Varying complaints may well signify a multiplicity of causes rather than a single one. Primary cancers in various combinations are seen, such as lung-prostate-skin or breast-uterus-bowel, as reported in this case.

In clinical analysis of cases of multiple neoplasms, questions as to whether the lesions are primary or secondary or metastatic add to the complexity of evaluation. Microscopic studies are needed to resolve such problems. "Multiple tumors" may be made up of carcinoma (multiple primaries), metastatic growths, lymphoma, or even leukemia or benign disease.

Complete study is necessary for accuracy in diagnosis and prognosis, and for early and more aggressive therapy where indicated.

In the case here reported, the patient was treated for three primary cancers involving the breast, the uterus and the colon in a period of a year and a half.

REPORT OF A CASE

The patient, a 50-year-old, married, white woman secretary was first observed at age 42 with a cystic lump in the left breast. When aspiration was unsuccessful, biopsy was done and the pathologist reported benign cyst with cystic mastitis. The family history was entirely negative for cancer. Four years later a firm nodule was removed from the opposite breast. The pathologist reported it as showing fibrocystic disease with adenosis.

In the following year a biopsy specimen from the left breast again showed benign cystic disease. The patient was examined quarterly thereafter, and seven years later, in 1957, a biopsy specimen was taken from a lesion 0.2 x 0.3 cm. in the upper outer quadrant of the right breast (Figure 1) and the pathologist reported early mucoid carcinoma. Radical mastectomy was carried out. There was no evidence of regional or distal metastasis. Four months later, upon recurrence of cystic disease of the left breast, simple mastectomy and oophorectomy were advised. However, operation was temporarily deferred. During this period, rectal bleeding developed for the first time, and associated with it were abdominal cramps. Upon sigmoidoscopic examination a malignant neoplasm (Figure 2) was seen 26 cm. from the anus. A

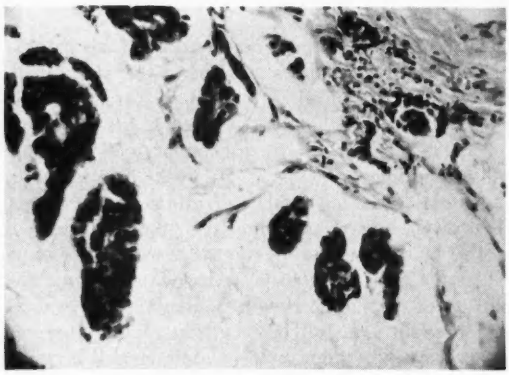

Figure 1.—Specimen from right breast, reported as early mucoid carcinoma. (Reduced from ×450.)

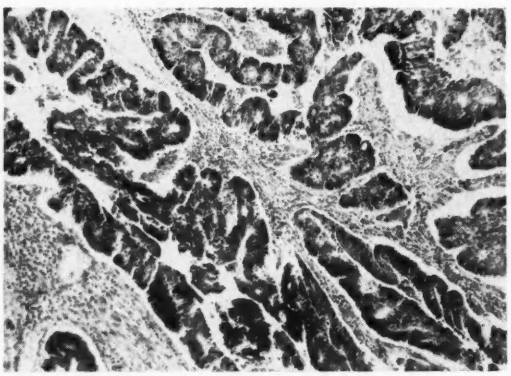

Figure 2.—Specimen from sigmoid colon reported as adenocarcinoma. (Reduced from ×450).

Presented at the Tumor Board Conference, St. Luke's Hospital, San Francisco, October 8, 1958, and January 7, 1959.

Submitted May 24, 1960.

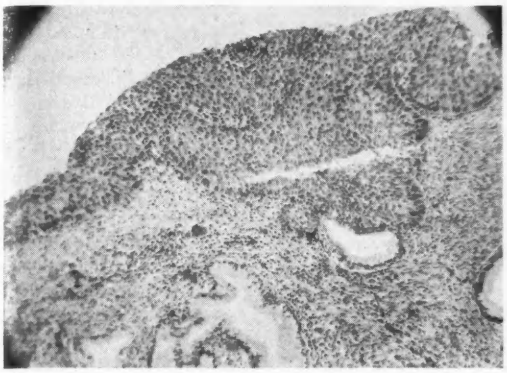

Figure 3.—Biopsy specimen from cervix showing carcinoma in situ. (Reduced from ×450.)

routine pelvic examination was then carried out and the uterine fundus and cervix appeared normal clinically, but results of cytologic examination of secretions from the area were strongly positive for malignant cells. At this time the menstrual cycle was normal. A cervical cone biopsy showed cervical carcinoma in situ. On abdominal exploration there was no clinical evidence of metastasis. No abnormalities were noted in the fundus of the uterus or in the adnexa. There was an annular constricting lesion of the lower sigmoid colon with mucosal ulceration of the tumor and extension to the serosa. No evidence of regional lymph node or distal metastasis was observed. Total hysterectomy and left colectomy were done simultaneously. Follow-up examination with sigmoidoscopy April 21, 1960, showed no evidence of local recurrence. The patient had gained weight and had returned to her previous employment.*

SUMMARY

The patient had primary carcinoma at three sites —breast, colon, uterus—in a period of a year and a half. In the instance of the uterine cancer, cytologic examination showed malignant disease although there was no clinical evidence of it.

No metastasis from any of the lesions was noted.

All three were surgically removed and the patient recovered.

595 Buckingham Way, San Francisco 27.

*Still being observed at quarterly intervals, the patient was well, without evidence of recurrence, in September of this year.

Lumbosacral Intervertebral Disc Disease in Children

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LUMBOSACRAL INTERVERTEBRAL DISC changes that bring about sciatic nerve disease and other neurological manifestations in the lower extremities is generally thought of as confined almost entirely in persons in the third decade of life or later. In a review of the literature following recent observation of a case seen in a child 12 years old, a number of references were found to its existence as a clinical entity in childhood and adolescence.

REPORT OF A CASE

The patient, a 12-year-old white girl, had always been in good health. She was quite athletically inclined, her activities including daily horseback rides, frequent rounds of golf, hunting trips and regular swimming. Six weeks before admittance to hospital, the patient began to notice a pain in the right buttock and posterior thigh which she characterized as a "deep ache." It was much worse when she straightened her leg. She also noticed some weakness in her foot. The pain and weakness gradually disappeared over the next two weeks even though she continued to be quite active.

Four weeks before admittance, the patient had a two-day episode of malaise, dry cough and a body temperature of 104° F., followed by the eruption of a maculopapular rash over the head, neck and trunk lasting five additional days. This was thought to be measles by a physician who observed her at that time. One week after the rash had disappeared, a more severe pain of the same type in the right posterior thigh, associated with spasm of the hamstring muscles, gradually developed, resulting in a limping gait with a flexed knee. Some pain in the lumbosacral region and weakness in dorsiflexion of the foot was noted. The patient was referred to a local hospital where she was examined by a neurosurgeon and a pediatrician. Physical examination was reported as showing hamstring spasm and weakness, and paravertebral muscle spasm. The results of neurological examination were otherwise negative. Results of blood cell count, urinalysis, spinal tap, sedimentation rate, determination, tuberculin tests, the urinary content of porphyrins and coproporphyrins, studies for lupus erythematosus cells and examination of stool specimens were negative or within normal limits. X-ray studies of the spine and hips showed no abnormalities except for "straightening of the lordotic curvature probably due to muscle spasm" and "slight scoliosis."

From the Neuropsychiatric Institute, U.C.L.A. Medical Center, Los Angeles 24.

Submitted May 19, 1960.

The patient was placed in traction for ten days with no improvement. The day after traction was removed, the Achilles reflex on the right, previously present, was not obtainable. Stool specimens were sent for viral studies. The patient was referred to the Ochsner Foundation Hospital, New Orleans, with suspicion of poliomyelitis or of coxsackie viral damage of anterior horn cells with resulting muscle weakness and spasm. Her condition was to be evaluated with the expectation that she would be sent to a local crippled children's hospital for physiotherapy.

The following abnormalities were noted upon physical examination: (1) Spasm and pain localized to the hamstring muscle group on the right, (2) scoliosis to the left, (3) paravertebral muscle spasm more pronounced on the right, (4) absence of Achilles reflex on the right, (5) hamstring pain accentuated by tapping over the fifth lumbar interspace on the right, (6) extreme pain in the right posterior thigh on raising the straightened leg anteriorly while the patient was supine, (7) slight diminution of pain and of response to light touch in the area of the foot served by the right first sacral nerve.

X-ray examination of the lumbar spine showed scoliosis to the left with slight narrowing of the fifth lumbar interspace. A myelogram done subsequently showed a slight filling defect in the sacroiliac root sleeve on the right. No abnormalities were noted on blood, urine and spinal fluid examination.

On the basis of these observations, a diagnosis of herniated nucleus pulposis of the intervertebral disc was considered.

In light of the possibility of neoplastic disease, the failure of conservative therapy (traction), and the continued progression of symptoms, operative treatment was decided upon. Hemilaminectomy was carried out and a protruding nucleus pulposis of the fifth intervertebral disc was removed. Symptoms immediately disappeared and four months after the operation the child was undertaking moderate exercise with no evidence of residual neurological damage.

DISCUSSION

One of the earliest reported cases of lumbosacral disc syndrome in a child was reported by Pease[7] in 1935. He reported the occurrence of sciatic nerve disease associated with narrowing of the intervertebral disc space in a six-year-old child following a traumatic diagnostic lumbar puncture. Love and Camp[6] reported the case of a 16-year-old boy who had nerve root pain following a fall, with relief by removal of a disc. Bradford and Spurling in their classical monograph in 1941[2] reported the case (Case 11) of a man who had had an episode of lower extremity pain and weakness at the age of 7. Similar pain was relieved several years later by removal of a lumbosacral disc. Alpers and coworkers[1] reported a series of cases of "sciatic neuritis" attributable to disc abnormality, including one case in a 16-year-old boy. A similar case, in a 12-year-old boy was reported by Wahren[9] in the Scandinavian literature. Love,[5] in a review of 1,217 patients operated on for lumbosacral disc disease at the Mayo Clinic from 1939 to 1941, observed that 2.1 per cent were between the ages of 10 and 19 years; no further age grouping for this series is available. Spurling and Gantham[8] added reports of four patients between 16 and 20 years of age in 1949. Key[4] reported on four patients 12, 14, 18 and 19 years of age, who were operated on for herniated disc disease, and on 40 "mild cases" of sciatic nerve disease in children and adolescents that cleared up with conservative therapy. Webb and coworkers,[10] reporting on 6,555 cases in which intervertebral disc operations were done at Mayo Clinic from 1942 to 1953, noted that 60 of the patients were under 18 years of age; the youngest was 12. Ford[3] reported a case of herniated intervertebral disc in a 9-year-old child with typical symptoms. Relief followed removal of the disc.

SUMMARY

Since it is generally thought of as occurring in the third decade of life or later, intervertebral disc disease is rarely considered in children who consult a physician because of symptoms of neurological impairment referrable to the lower extremities. A review of the literature, however, showed that the condition ought to be borne in mind in the differential diagnosis in cases of lower extremity signs and symptoms in children. A case history of a 12-year-old with a herniated nucleus pulposis of the fifth lumbar intervertebral disc illustrates the kinds of diagnostic difficulties that can be encountered.

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MATTHEW N. HOSMER, M.D. . . . . San Francisco
IVAN C. HERON, M.D. . . . . San Francisco
DWIGHT L. WILBUR, M.D. . . . . San Francisco

EDITORIAL

Mental Health in California

ANY PERIOD of mushrooming population brings with it a wide variety of problems. Citizens of California, which has undergone a tremendous upsurge in population in the past two decades, can well appreciate this fact.

Transportation, water supplies, highways, housing, food supplies and communications have all been taxed to the utmost to meet the demands of the thousands of residents who pour across the state's borders in the continuing migration into California.

In addition to these everyday necessities, the health of the state has constituted an ever-increasing problem. Medical, dental, nursing and other health personnel have expanded sufficiently to provide generally adequate service for the enlarged population but in the field of facilities there has been a lag between demand and construction.

General hospitals have been added to and new ones constructed. Hospital districts have been formed under state laws designed to bring new hospitals into being in areas which have suddenly found a need for them. While there is bound to be a time lag in this area, the hospital facilities of the state have been constantly augmented to meet the growing demand.

In the field of mental health, where the state has of necessity shouldered the greater part of the total burden, the problems of hospital construction and patient care have assumed tremendous importance. As the total population grows and the percentage of that population requiring mental care remains relatively fixed, the number of patients automatically increases. And, where the laws of the state and its subdivisions make it possible and even attractive for individuals and communities to shift the responsibility for mental health services to the state, the problems at state level have grown almost to the point of intolerability.

Fortunately for the State of California and for its citizens and taxpayers, the solutions to these problems have been more than adequately developed.

Governor Brown saw fit two years ago to go outside the boundaries of California for a Director of Mental Hygiene. He chose Doctor Daniel Blain for this post, the first state officer of cabinet rank to come from another state.

Doctor Blain has taken over the largest single department in the state's government. He administers a program which accounts for about $140 million a year in expenditures, employs some 20,000 employees, including 550 physicians, and provides care for about 85,000 patients a year. To house its patients the department maintains 47,000 hospital beds which at any given time are occupied by about 45,000 patients.

This area of responsibility makes the State Department of Mental Hygiene not only the largest department of the state government but also the largest employing unit of the State, with about 20 per cent of all state employees on its payroll.

Where such a large concentration of employment and spending is involved in governmental affairs, the tendency toward bureaucracy is both inherent and tempting. Fortunately, this department of our state government, under the present administration, is heading in the opposite direction. In large part this trend may accurately be attributed to the director.

Daniel Blain comes to California from a background as a psychiatrist in private practice, with experience in administering private psychiatric hospitals. During World War II and for several years afterward he served the federal government in the Public Health Service, the War Shipping Administration and the Veterans Administration. Subsequently he spent ten years as Medical Director of the American Psychiatric Association.

In his present post Doctor Blain brings with him his close working relationship with the private practice of medicine and with medical organizations. His

many years in private practice have apparently convinced him of both the responsibility and the capacity of private practitioners in caring for mental patients.

Doctor Blain has been successful in achieving an increased turnover in state hospital bed occupancy, so that the need for building additional large state hospitals has, at least for the time being, been eliminated. He has also instituted an extensive program of in-hospital psychiatric training, to provide through specialized courses a professional background which many of the physicians on the staff had not previously attained.

In addition, an extensive research program, amounting to some $3,000,000 a year, most of it in foundation funds, is now under way.

By developing these programs the director has made it possible for a growing percentage of the total mental health program in the state to be handled by private resources and by governmental agencies below the state level. Assisting in this development has been the Short-Doyle program, under which the state contributes a share of the cost of operating mental health facilities on a local or county basis.

Today about 45 per cent of the total mental health care program in California is handled by private resources. Under the program of the state department, every effort is being made to increase that amount to at least half the entire case load. The department feels not only that better care is given the individual patient by the use of home and family environmental resources but also that there must be a limit to the amount of state tax funds which can be applied to mental health at the state level.

Inherent in this program is a sense of responsibility by private physicians and a spirit of cooperation by private physicians and their organizations. The California Medical Association, through the Council, has been quick to embrace the program developed and planned by Doctor Blain. The cooperation of appropriate committees in the Association has been given and assured for the future. The Council itself has welcomed the director at its meetings and has complimented him on his approach to a large problem that affects all Californians.

On another page of this issue is an article by Doctor Blain which gives in detail the plans and the philosophies espoused by him and by his department. This article not only shows the planning for the total mental health problem but indicates the support for this program by the Governor and by the heads of other departments of the state who work closely with the Department of Mental Hygiene.

If the philosophies of this huge mental health program can be continued and if individual physicians and governmental entities below the state level will continue to assume their responsibilities and positions, it is obvious that the needs of the people in the field of mental health will be well met.

California MEDICAL ASSOCIATION

NOTICES & REPORTS

Medical Expert Panels for Malpractice Cases

C.M.A. Liaison Committee with the State Bar of California

The Council of the California Medical Association, at its September, 1957, meeting, and the Board of Governors of the State Bar of California, approved and recommended to county societies the establishment of medical expert panels for the use of plaintiff attorneys in malpractice cases when a county bar association and medical society determined it was in the public interest to do so.

Ground rules and procedures to guide this endeavor were developed by a Joint Liaison Committee of the State Bar and of the C.M.A., and these rules are described in the February, 1958 issue of CALIFORNIA MEDICINE and in the January-February, 1958 issue of the *State Bar Journal*, entitled "Medical Expert Panels for Malpractice Cases."

In essence, leading physicians in general practice and in various medical specialties are selected by a county medical society committee as panelists to make their services available to examine, render a report upon, and, if medically justified, testify on behalf of an aggrieved person where medical malpractice is found to exist. Under the supervision of county medical societies and bar associations, the attorney for an alleged victim may secure the services of such a panelist, who will examine and render a report with his opinion as to whether medical malpractice exists, for a reasonable charge. Should the cause proceed to trial, the panelist may, at the election of the aggrieved party, testify as to his examination and findings, again for a reasonable fee. Should his services not be desired, the report is privileged and may not be examined, nor may the physician be called to testify at the defendant's request. Provision is made for a second panelist from another medical field to examine, should the first panelist deem it necessary. A second panelist in the same field may also be called at the request of the injured party, but if this is done, a waiver of privilege as to the first examination must be given.

This program was designed to fill the vacuum created by the frequent refusal of one physician to testify against another, and the professional stigma that attached to him when he did. It is to the credit of the medical profession, prompted by a spirit of fairness and the desire to fulfill a public need, that they inspired the proposal for the creation of the panel system.

The Liaison Committees of the two State associations have continued to study the development of this unique program.

OPERATION OF THE PANEL SYSTEM

At the present time the panel system is in operation in three counties: Los Angeles, San Francisco and San Diego. Its operation is imminent in Alameda County and is being considered in some of the smaller counties or councilor districts throughout the state. Since its inception, the panel has been used sixty times in Los Angeles, fifteen in San Francisco, and twelve in San Diego. The joint committees determined that by the time of their second meeting in April, a sufficient experience would have been had in Los Angeles to justify submission of a questionnaire to medical panelists and to the plaintiff attorneys who had sought their services, in specific cases involving medical malpractice. Accordingly, a questionnaire was drafted by the two groups and submitted to the doctor and lawyer involved in each of twenty-nine cases.

Report of the C.M.A. Liaison Committee with the State Bar of California, July 11, 1960.

PAUL D. FOSTER, M.D. . . . . President
WARREN L. BOSTICK, M.D. . . . . President-Elect
JAMES C. DOYLE, M.D. . . . . Speaker
IVAN C. HERON, M.D. . . . . Vice-Speaker
SAMUEL R. SHERMAN, M.D. . . Chairman of the Council
RALPH C. TEALL, M.D. . . Vice-Chairman of the Council
MATTHEW N. HOSMER, M.D. . . . . Secretary
DWIGHT L. WILBUR, M.D. . . . . Editor
HOWARD HASSARD . . . . . Executive Director
JOHN HUNTON . . . . . Executive Secretary
General Office, 693 Sutter Street, San Francisco 2 • PRospect 6-9400
ED CLANCY . . . . . Director of Public Relations
Southern California Office:
2975 Wilshire Boulevard, Los Angeles 5 • DUnkirk 5-2341

The questionnaire submitted to the doctor included the name of the lawyer requesting consultation, name of patient; nature of complaint or injury, cooperation of the lawyer, whether the report was of assistance to the attorney's appraisal of the case; whether the matter proceeded to trial and if so, whether the panelist was used as a witness, whether the matter was settled or compromised or otherwise disposed of, and whether the panel system was considered to be of value and should be continued. A similar questionnaire was submitted to the attorney requesting the examination. He was additionally asked to appraise the cooperation of the panel member, the apparent objectiveness and fairness of his report, whether it was of assistance in appraising the case, whether the matter proceeded to trial, whether the panelist was used as a witness; whether the panelist's report was of value in effecting settlement if the case was settled, or whether the case was otherwise disposed of. He too was asked whether the panel system was of value in his opinion and should be continued.

Of the twenty-nine such cases surveyed, twenty-eight doctors and twenty-five lawyers replied. All physician-panelists gave their unqualified approval as did all of the attorneys except four who expressed some doubts about its usefulness. In at least two cases, the panelist testified in court on behalf of the plaintiff. In one of these instances, the jury found for the defendant despite the panelist's contrary opinion. In several other instances the report and findings were instrumental in securing a settlement in a substantial amount; in other instances it resulted in the case being declined. Some of the comments on the panel system made by the attorneys and physicians familiar with it serve to illustrate their appraisal of its usefulness:

(a) A partnership of attorneys said of the physician-panelist: "His report was not only complete and thorough, but I considered it extremely objective and very fair and honest. . . .

"Although our experience is limited to this one use of the panel, I can say, unequivocally, that [my partners] and I are heartily in favor of its continuance."

(b) A firm of attorneys reported: "Within the past four to six month period, this office has sought medical advice from panel members in regard to malpractice litigation a good half dozen times. We have used panel members as expert witnesses in two malpractice trials within the past month. . . .

"The undersigned has complete unhesitancy in going on record, publicly or otherwise, in wholehearted support of the panel system. . . .

"In short, the undersigned is of the unqualified opinion that the panel system should be continued. It is a giant step in bringing a strong, impersonal light to bear on the facts of a given situation, and in only this way are the ends of justice served to all parties."

In answer to the question: "Do you feel this panel system to be of value and that it should be continued?" most of the attorneys gave such answers as: "Yes," "Decidedly, yes," "Absolutely," "Yes—with modifications," "I found it most helpful," and one "No."

The physician-panelists were asked the same questions and they gave answers such as the following:

"I do feel that the panel system is of value and it should be continued," "Yes, the panel system is valuable," "Believe this panel system to be of great value far and beyond what one would ordinarily expect it to be. If continued judiciously and intelligently, it will cut down malpractice cases by a large percentage," "I think that the system is absolutely necessary for the protection of the medical profession against charges leveled that doctors will not testify against each other even in genuine cases of malpractice," "I believe the panel system is of considerable value in averting the filing of unjustified malpractice actions." One panelist testified for the plaintiff in a case in which the jury returned a verdict for the defendant-physician.

One physician-defendant learned of the survey and took occasion to write as follows:

"I would like to take this opportunity to express my appreciation for the assistance rendered the undersigned in preventing a malpractice lawsuit initiated by ————————. I would especially like to thank Dr. ———————— for his time and careful study of the case."

Based on the information set forth on the questionnaire returned, the results of the twenty-nine cases in which the panel was used, can be summarized as follows:

Six (6) cases—results unknown;
Ten (10) cases—final result still pending;
Six (6) cases—decided in favor of physician-defendant;
Seven (7) cases—settled.

The members of both Liaison Committees conclude that a breakthrough has been achieved in securing voluntary physician testimony in meritorious cases and that continued existence of the present program will not only result in an improvement in this segment of the administration of justice, but will go far to improve the relationship between the two professions with each other and with the public.

Respectfully submitted,

LIAISON COMMITTEE WITH THE STATE BAR
FRANCIS E. WEST, M.D., *Chairman*
CYRIL J. ATTWOOD, M.D.
DONALD A. CHARNOCK, M.D.
REES B. REES, M.D.
J. NORMAN O'NEILL, M.D.

PUBLIC HEALTH REPORT

MALCOLM H. MERRILL, *M.D., M.P.H.*
Director, State Department of Public Health

THE DEPARTMENT has published, in booklet form, standards and recommendations for public prenatal care. The standards were developed as an outgrowth of a 1955-56 study which showed serious deficiencies in quality and quantity of prenatal care. Then, as now, maternal and neonatal mortality was higher in public institutions than in private institutions.

The department's Advisory Committee on Maternal and Child Health urged that standards be developed as a means of improving the care given in public institutions.

While these standards and recommendations are offered as a guide to professional health workers responsible for providing prenatal care services, they may also be helpful to physicians in private practice and to staff of non-tax supported prenatal care facilities.

The standards were reviewed by the Committee on Health Services of the California Conference of Local Health Officers, the Committee on Maternal and Child Care of the California Medical Association, and the Council of County Hospitals of the California Hospital Association.

Copies of the standards can be obtained from local health departments and all county hospitals with maternity services.

* * *

State and federal matching funds totalling more than $16½ million were allocated in October by the department's Advisory Hospital Council for the construction of 24 hospital and health facilities projects. The state-federal funds represent two-thirds of project financing, with the remaining one-third provided by the local community.

The funds were allocated to the following projects (the amounts represent total state-federal funds):

General Hospitals: Needles Municipal Hospital, $145,200; Roseville District Hospital, $1,050,000; Lake Tahoe Community Hospital, $598,010; Palo Verde Hospital, Blythe, $520,000; Barstow Community Hospital, $206,570; Victor Valley Lutheran Hospital, Victorville, $829,288; St. Joseph Hospital, Santa Ana, $4,114,600; San Antonio Community Hospital, Upland, $2,500,400; Seaside Hospital, Crescent City $498,882, and Trinity General Hospital, Weaverville $230,476.

Psychiatric: San Antonio Community Hospital, $80,000; Glendale Sanitarium and Hospital, $671,780, and Vista Hill Psychiatric Foundation, San Diego, $856,422.

Health Centers: Butte County Health Department, Chico, $151,270; Sacramento County Hospital, $630,948; Los Angeles City Health Department, South District, $100,200; San Joaquin Local Health District, Stockton, $379,244, and San Francisco City and County Health Department, Eureka-Noe District, $124,380.

Long Term Care: Rancho Los Amigos, $1,242,080, and Holy Cross Hospital, San Fernando, $335,568.

Diagnostic and Treatment Centers: Santa Clara County Hospital, San Jose, $501,760, and Children's Hospital of the East Bay, Oakland, $47,132.

Rehabilitation: Los Angeles County General Hospital, $705,934, and Rehabilitation and Research Center of Crippled Children's Society of San Mateo County, Burlingame, $117,104.

* * *

The number of births registered in California the first eight months of this year indicates that California's birth rate will be about the same as in 1959. If this trend continues, California will have 372,000 births in 1960, an increase of 14,000 over last year, and the birth rate will be 23.5 per thousand, same as in 1959.

This trend is different from that of the rest of the country, since the National Office of Vital Statistics has reported a current decline in the total number of babies born in the United States for the first half of 1960.

The death rate in California will increase slightly in 1960, largely because of the relatively high level of mortality from the pneumonia and influenza outbreak which occurred during January and February.

Barring any unusual increases in the last quarter, California will have approximately 136,000 deaths this year, and the crude death rate will be 8.6 per thousand, about 2 per cent higher than 1959.

WOMAN'S AUXILIARY
TO THE CALIFORNIA MEDICAL ASSOCIATION

Fall Conference

ONE OF THE MOST stimulating and rewarding personal experiences to me, was the recently conducted fall conference of the Woman's Auxiliary to the California Medical Association at the Disneyland Hotel on September 23 to 26. This conference was conducted for county presidents, county presidents-elect, county chairmen, county chairmen-elect and state committee chairmen. The format was that of a workshop. The purpose of the fall conference was to teach and be taught; to exchange ideas so that we may become better leaders in our auxiliary and our communities; and to formulate plans for the current year. The conference lasted three days and was crowded with activities, which, I hope, proved beneficial and profitable to those attending.

Since most of the doctors' wives—and certainly the doctors (with but a few exceptions) could not be in attendance, a review of the activities might be of value, and also serve to remind the doctors that conferences can be conducted with dispatch and efficiency.

A highlight of the agenda on the first evening's program was a talk by Mrs. William Mackersie, president of the Auxiliary to the American Medical Association. It was certainly a privilege and a pleasure to have her with us. Mrs. Mackersie, an active auxiliary worker for some twenty-seven years, made us aware of auxiliary and its potential. Her concentrated message was most stimulating, for she outlined the plans and hopes she is fostering to stimulate our activities and interests.

The Membership Panel, moderated by the membership chairman, Mrs. Floyd K. Anderson, consisted of four county presidents representing counties of varying membership. Since the ultimate goal of the auxiliary is to have every eligible wife a member, many and varied methods of interesting doctors' wives to become active and interested in auxiliary were presented and ideas exchanged. Methods of obtaining new members, regaining resigned members and stimulating the interest and active participation of former inactive members were outlined in the panel discussion.

The Panel for Woman's Auxiliary-Students American Medical Association, consisted of a medical student and three medical students' wives. It was conducted by Mrs. Matthew Hosmer, the state chairman. Although this committee was formed only this year, its activities were most enlightening to the many county presidents who were unfamiliar with it.

A most informative panel was that on Health Careers. The State Health Career chairman, Mrs. Leonard Offield, was moderator and two county presidents participated as panelists. The Health Career Conference, which I recently covered in one of my articles, was presented in detail, much to the delight of the many interested counties. Information on nurse recruitment, future nurses clubs and the other allied fields of medicine was outlined in detail. This committee remains a very popular and important one since it represents one of our key projects.

The state chairman of Physicians' Benevolence Committee, Mrs. Milton Schatz, presented an excellent résumé of this important committee's work. She explained the background and the need for such a fund. The desire of the C.M.A. to care for their own and the hope for continuing support from the counties were emphasized. The chairman explained the financial aspects of this program and emphasized the importance of financial support.

The panel on Community Service, formerly called Public Relations, was moderated by the state chairman, Mrs. Angus McDonald, with four county presidents serving as panelists. Importance of this committee is demonstrated by the fact that it has a close relationship with all of the other committees. Since the committee serves within the boundaries of all communities, it needs the cooperation of the Community Service Committee. Each panelist presented the "unusual" that she does in her own community. Amongst the "unusual" was San Francisco's "Meals on Wheels" project, which interested small and large counties alike.

The panel on Problems of the Aging, with Mrs. Theodore Poska as chairman, was a most informative one. It was of particular interest to the county presidents, for it fulfilled their desire to not only

assist the C.M.A. in this program, but to encompass as much information as possible. Only by this means can we relay to the public correct and precise information.

The Civil Defense Committee presented its important message in the form of a skit—depicting the necessities of being well prepared. Home Preparedness was the title of this most informative skit. Mrs. Fenimore Davis, state chairman, was the moderator, and three county presidents were the participants.

The GEMS (good emergency mother substitutes) panel was moderated by the state chairman, Mrs. Hugh McVeigh, with four county presidents participating. There was an excellent exchange of ideas for the training of good emergency mother substitutes. This program is growing rapidly in popularity with teen-agers and other organizations.

Another informative panel was one on the American Medical Education Foundation. This committee we hold high amongst our projects. The state chairman, Mrs. John Lagen, had as her panelists the presidents of three of our counties who had raised monies in unusual ways. There was a brisk exchange of ideas which proved beneficial to all. Following this panel there was a presentation of awards to the county that contributed most money to A.M.E.F., to the county that contributed the most per capita and to the county that presented the most novel idea.

The Safety Committee presented a novel program, using a hat show to emphasize Home Safety. The eleven models that participated were county presidents and presidents-elect. Each model wore a hat trimmed with various hazards to safety encountered in the home. The appropriate script for each was read by the state Safety Committee chairman, Mrs. Charles Jobbins.

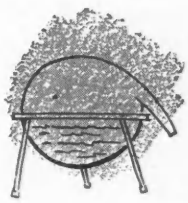
The State Program chairman, Mrs. Albert Miller, divided the counties into two categories—those counties with a membership of over 100, and those with membership of under 100. Discussions were held with each group. Since a good program stimulates the interest and enthusiasm of the membership, which in turn engenders an increase in membership, this was an effective means of informing the county presidents.

We felt most flattered, and honored, indeed, that the C.M.A. Advisory Board gave of their valuable time to participate in the fall conference. This was the highlight of the three-day session. Dr. Paul Foster, president of the C.M.A., spoke to us on "Governor's Committee for Medical Care Needs in California." Dr. Samuel Sherman, chairman of the C.M.A. Council, enlightened us on "Recent Council Action of Dramatic Nature." Dr. Warren Bostick, president-elect of the C.M.A., informed us with regard to "Medical Care for the Elderly." Dr. Malcolm Todd, a member of the Council, having returned that very morning after accompanying Mr. Nixon on one of his campaign tours, brought us the "last minute" news regarding our Vice-President, and spoke on "Accelerated Public Relations Program of the C.M.A. and How Can the Auxiliary Join Forces on a Partnership Basis to Implement this Program." Mr. Howard Hassard, executive director, C.M.A., presented vital information on "The Legislative Side of Our Problem." The women were most enthusiastic with this excellent panel, for it gave us valuable and important information. I wish to express my appreciative and grateful thanks to them, for a stimulating and most worthwhile program.

I am grateful, also, to the moderators, panelists and speakers of this conference, who I felt, brought a wealth of information, wisdom, and food for thought. I am sure that much good will accrue to those who attended.

This conference could not have been possible or successful, without the capable and efficient cooperation of the fall conference chairman, Mrs. Bernard Mason of Huntington Beach, and her diligent and conscientious committee women, Mrs. G. Emmett Raitt, Mrs. J. B. Price, Mrs. Lewis Ellmore, Mrs. Van Kaye and Mrs. John Montanus. My grateful and appreciative thanks goes to each of them.

MRS. SAMUEL GENDEL,
President, Woman's Auxiliary to the California Medical Association



EVALUATION OF INDUSTRIAL DISABILITY

Through the efforts of the California Medical Association's Subcommittee for Standardization of Joint Measurement, the book titled *Evaluation of Industrial Disability*, which was written by the committee and published by Oxford University Press in 1950, has been revised and the second edition is now available.

The following material covers the changes that have been made in the second edition (the page numbers refer to the pages in the first edition):

Girth of the forearm is to be taken normally only at the point of maximum circumference. Page 18.

Finger Abduction has also been termed "Spread of Fingers" as an additional term. Page 48.

Thigh Girth will be taken only at a point one-third of the distance up from the upper patella to the umbilicus under normal circumstances. (Delete illustration 62B, Page 69.)

Calf Girth will normally only be taken at the point of maximum circumference. Page 70.

Measurements of Toe Motion will be taken on a passive basis (due to many patients having difficulty in demonstrating active toe motions). Pages 84-87.

Definitions of Subjective Disability adopted by the California Industrial Accident Commission on June 26, 1956, have been added to the text. This information is printed on Page 2 of the Official Minimum Medical Fee Schedule of the Industrial Accident Commission under paragraph 13.

The price of the second edition is $1.25. Copies may be obtained from your book dealer or from Oxford University Press, Inc., 417 Fifth Avenue, New York 16.

Added to the new edition is a section titled Estimated Average Normals as follows:

ESTIMATED AVERAGE NORMALS

These average normals given below are to be used only as a guide in cases of bilateral injuries or pre-existing disabilities; and whenever used, the individual characteristics of the patient under consideration must be used to modify these figures, e.g. age, stature, weight, range of motion of other body joints, etc.

SHOULDER

Extension	30
Abduction	170
Flexion	170
Internal rotation	60
External rotation	80

ELBOW

Extension	180
Flexion	135

FOREARM

Supination	85
Pronation	75

WRIST

Dorsiflexion	65
Palmar flexion	70
Ulnar deviation	40
Radial deviation	20

THUMB

Abduction	55
Tip misses 5th metacarpal head	0

HAND

Thumb	PROX.	MID.	DIST.
Ext.	175	***	200
Flex.	50	***	75
Index			
Ext.	180	180	180
Flex.	85	100	70
Middle			
Ext.	180	180	180
Flex.	90	100	70
Ring			
Ext.	180	180	180
Flex.	90	100	70
Little			
Ext.	180	180	180
Flex.	90	100	70

HIP

Flexion	110
Extension	30
Internal rotation	35
External rotation	50
Abduction	50
Adduction	30

KNEE

Extension	180
Flexion	135

ANKLE

Dorsiflexion	15
Plantar flexion	50
Eversion	20
Inversion	35

GREAT TOE PROXIMAL JOINT

Extension	40
Flexion	25

NEWS & NOTES

NATIONAL · STATE · COUNTY

ALAMEDA

The American Public Health Association last month bestowed the **Albert Lasker Award** upon the Chronic Disease Control Program of the California Department of Public Health and upon the chief of that division of the department, **Dr. Lester Breslow.** The award was made for a program, begun 15 years ago, which has become widely celebrated for major studies in the prevention and control of chronic disease throughout the state.

* * *

Dr. Joseph Sadusk, Jr., Piedmont, was elected president-elect of the California Society of Internal Medicine at its annual meeting, which was held in Yosemite National Park in September. **Dr. A. Lee Edgar** of La Mesa was installed as president.

LOS ANGELES

Dr. Forrest E. Leffingwell, Pasadena, was elected president-elect of the American Society of Anesthesiologists at the annual meeting of the society in New York last month. **Dr. Douglass H. Batten,** San Diego, was elected first vice-president and **Dr. James L. Rhee,** Oakland, vice-speaker of the house of delegates.

The New York City meeting was reported one of the best attended in the organization's history, with more than 2,100 registered from the United States and 200 from foreign countries.

* * *

The thirteenth annual **Midwinter Radiological Conference,** sponsored by the Los Angeles Radiological Society, will be held at the Biltmore Hotel, Los Angeles, California, on Saturday and Sunday, January 28 and 29, 1961.

An outstanding program of pertinent interest has been arranged, the announcement said, and the guest speakers will be Dr. James W. D. Bull, London, Dr. John Boland, New York, Dr. John A. Kirkpatrick, Philadelphia, and Dr. John F. Holt, Ann Arbor.

SANTA CLARA

Dr. Burt L. Davis of Palo Alto was elected president-elect of the California Academy of General Practice at the annual convention of the organization in San Francisco in October.

Dr. Ralph L. Bennett of Los Angeles was named speaker of the Academy's governing body.

SAN FRANCISCO

Dr. John W. Cline was installed as president of the American Cancer Society at the society's annual meeting in New York in October.

Dr. Cline, a successful champion of legislation against cancer quackery in California, is a past president of the California division of the Cancer Society, of the California Medical Association, and of the American Medical Association.

At the meeting, Mrs. Roger Goodan of Los Angeles, who was reelected vice-president of the organization, presented a check of $364,000 for cancer research as a contribution from the California Division.

* * *

Mrs. Lillie Woods of San Francisco was elected president-elect of the **American Association of Medical Assistants** at the recent annual meeting in Dallas, and more than 400 women employed as nurses, medical secretaries and medical assistants in physicians' offices throughout the country attended the organization's three-day educational program and business sessions.

SHASTA-TRINITY

The new officers of the Shasta-Trinity County Medical Society, named at the annual meeting last month, are: President, Dr. Robert E. Breeden, Weaverville; vice-president, Dr. George A. Martin, Redding, and secretary-treasurer, Dr. Vernon R. Gee.

GENERAL

A symposium on clinical nutrition will be held in Washington, D. C., November 30, 1960. Sponsored by the Council on Foods and Nutrition of the American Medical Association in cooperation with the Medical Society of the District of Columbia, the meeting will be opened to all interested persons.

POSTGRADUATE EDUCATION NOTICES

THIS BULLETIN of the dates of postgraduate education programs and the meetings of various medical organizations in California is supplied by the Committee on Postgraduate Activities of the California Medical Association. In order that they may be listed here, please send communications relating to your future medical or surgical programs to Postgraduate Activities, California Medical Association, 2975 Wilshire Boulevard, Los Angeles 5.

UNIVERSITY OF CALIFORNIA AT LOS ANGELES

Clinical Traineeships — Anesthesia, Dermatology and Pediatric Cardiology. Dates by arrangement. Minimum period—two weeks. Fee: Two weeks, $150.00; four weeks, $250.00.

Proctology—Lecture and Surgery Demonstration. Wednesday, November 30. Nine hours. Fee: $40.00 for full course; $25.00 for noon and evening courses.

Treatment of Selective Hematologic Disorders. Saturday, December 10. Eight and one-half hours. Fee: $25.00 (includes lunch).

Below-Knee Prosthetics. Monday through Friday, December 12 through 16. Enrollment limited to 20. Fee: $125.00.

Mexico—Clinical Postgraduate Program (sessions to be held in Mexico City, Guadalajara and Acapulco). January 7 through 22. Twenty-four hours. Fee: $125.00.

Bedside Clinics (Harbor Hospital, Torrance). Thursdays, January 12 through March 30. Twenty-four hours. Fee: $50.00.

An Evaluation of Librium. Saturday, January 14. Eight hours. Fee: $2.50.

Below-Knee Prosthetics. Monday through Friday, January 23 through 27. Enrollment limited to 20. Fee: $125.00.

Office Surgery. Saturday and Sunday, February 18 and 19. Twelve hours. Fee: $40.00.

Fractures (Lecture and Dissection). Friday through Sunday, February 24 through 26. Eighteen hours.*

Retinal Surgery. Thursday and Friday, March 2 and 3. Twelve hours.*

Psychiatry in Medicine. Friday and Saturday, March 10 and 11. Twelve hours. Fee: $15.00 (includes one lunch and one dinner).

A Symposium on Pain. Friday, Saturday and Sunday, April 7, 8 and 9. Twelve hours. Fee: $50.00.

Israel—Clinical Postgraduate Program (sessions to be held in Jerusalem and Tel Aviv). April 20 through May 15. Thirty-two hours. Fee: $200.00.

Low Back Pain. Friday and Saturday, May 12 and 13. Twelve hours. Fee: $50.00.

Gerontology. Friday and Saturday, May 19 and 20. Twelve hours.*

Common Emergencies in Clinical Practice. Friday and Saturday, May 26 and 27. Twelve hours. Fee: $40.00.

Advanced Seminars in Internal Medicine. Sunday through Wednesday, July 9 through 12. University Conference Center, Lake Arrowhead. Eighteen hours. Fee: $137.50 (includes room and meals).

Dermatology in Clinical Practice. Monday and Tuesday, July 10 and 11. Twelve hours.*

Advanced Seminars in Dermatology (for Dermatologists). Wednesday through Sunday, July 12 through 16. University Conference Center, Lake Arrowhead. Fourteen and one-half hours. Fee: $150.00 (includes room and meals).

Infertility. Friday and Saturday, July 14 and 15.†

General Pediatrics. Wednesday through Sunday, August 2 through 6. University Conference Center, Lake Arrowhead. Sixteen hours. Fee: $150.00 (includes room and meals).

For information on courses for physicians or ancillary personnel *contact:* Thomas H. Sternberg, M.D., assistant dean for Continuing Medical Education, U.C.L.A. Medical Center, Los Angeles 24. BRadshaw 2-8911, Ext. 7114.

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Retinal Detachment Surgery. Thursday through Saturday, December 1 through 3. Twenty-one hours. Fee: $50.00.

The Hip. Friday through Sunday, December 9 through 11. Twenty-one hours. Fee: $50.00.

Vectorcardiography. Saturday, December 17. Seven hours. Fee: $20.00.

Symposium on Eye Problems in Children, Children's Hospital. Saturday, January 14. Seven hours. Fee: $12.50.

Man and Civilization: The Control of the Mind. Saturday through Monday, January 28 through January 30. Twenty-one hours. Fee: $25.00.

A Course in Pediatrics. Saturday through Monday, February 11 through 13. Twenty-one hours.*

Medicine for General Practitioners. Mount Zion Hospital. Monday through Friday, February 20 through 24. Thirty-five hours.*

Pediatric Neurology. Thursday through Saturday, March 2 through 4. Twenty-one hours.*

Urology. Thursday through Saturday, March 9 through 11. Twenty-one hours.*

Symposium on Perinatal Problems, Children's Hospital. Saturday, March 11. Seven hours. Fee: $12.50.

Diagnostic Radiology. Wednesday through Sunday, March 15 through 19. Thirty-five hours.*

Fundamental Practices of Radioactivity and the Diagnostic and Therapeutic Uses of Radioisotopes. Two or three month course limited to one enrollee per month. Fee: $350.00.

For information on courses for physicians or ancillary personnel *contact:* Seymour M. Farber, M.D., assistant dean, Department of Continuing Medical Education, University of California Medical Center, San Francisco 22. MOntrose 4-3600, Ext. 665.

PRESBYTERIAN MEDICAL CENTER, SAN FRANCISCO

What's New in Urology. Sunday, December 11. Eight hours. Fee: $25.00.

Hematology and Cancer Chemotherapy. Saturday, January 7. Eight hours. Fee: $25.00.

Common Problems in Pediatrics. Sunday, January 29. Eight hours. Fee: $25.00.

Dermatologic Therapy. Saturday, February 11. Eight hours. Fee: $25.00.

Diabetes and Thyroid Disease: Current Methods in Diagnosis and Treatment. Saturday, February 25. Eight hours. Fee: $25.00.

The Four R's of Fractures: Recognition, Reduction, Retention, Rehabilitation. Saturday, March 11. Eight hours. Fee: $25.00.

Problems in Therapy of Cardiac Disease. Sunday, April 9. Eight hours. Fee: $25.00.

Problems in Neurology and Neurosurgery. Saturday, May 6. Eight hours. Fee: $25.00.

Psychological Problems in General Practice. Sunday, May 21. Eight hours. Fee: $25.00.

Horizons in Surgery. Saturday, June 17. Eight hours. Fee: $25.00.

Note:

Each one of 10 conferences listed above	$ 25.00
The complete series of 10 conferences	150.00
A series of any 5 conferences	100.00

Operable Heart Disease. Friday and Saturday, March 3 and 4.

Conference on Keratoplasty. Wednesday through Friday, March 8 through 10.

General Review Course for Practicing Physicians. Thursday through Saturday. March 16 through 18.

Conference on Strabismus. Wednesday through Friday. July 12 through 14.

Contact: Arthur Selzer, M.D., program committee chairman, Presbyterian Medical Center, Clay and Webster Sts., San Francisco 15.

*Fee to be announced.
†Hours and fees to be announced.

UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES

Recent Advances in Medicine. Thursday and Friday, November 17 and 18. Huntington-Sheraton Hotel, Pasadena. Fee: $25.00.

Nuclear Medicine:
Part I, January. Fee: $50.00.
Part II, eight weeks. Fee: $350.00.
Part III, twelve weeks. Fee: $350.00.

Clinical Hematology. Saturday and Sunday, February 25 and 26.*

Hawaii Course. August 2 through 18. The USC School of Medicine will offer the 4th Postgraduate Refresher Course to be held in Honolulu and on board the S.S. Matsonia. (As a time and money saver, air travel is also possible.)

Cardiac Resuscitation. Each Wednesday by appointment, 4 to 6 p.m. USC Medical Research Building, Room 211, 2025 Zonal Avenue. Tuition: $30.00. (Each session all-inclusive.)

Basic Home Course in Electrocardiography. One year postgraduate series, electrocardiogram interpretation by mail. Physicians may register at any time and receive all 52 issues. Fifty-two weeks. Fee: $100.00.

Advance Home Course in Electrocardiography. One year postgraduate series, electrocardiogram interpretation by mail. Fifty-two issues: $85.00. Physicians may register at any time.

Contact: Phil R. Manning, M.D., associate dean and director, Postgraduate Division, University of Southern California School of Medicine, 2025 Zonal Avenue, Los Angeles 33. CApital 5-1511.

COLLEGE OF MEDICAL EVANGELISTS

SURGICAL ANATOMY (Dissection, Lectures and Demonstrations):

Thorax, Abdomen, Pelvis. Monday and Wednesday, January 4 through April 12. 121 hours. Fee: $125.00.

Head and Neck. Monday and Wednesday, April 19 through May 31. Sixty-three hours. Fee: $75.00.

SURGICAL ANATOMY (Lectures and Demonstrations only):

Thorax, Abdomen, Pelvis. Wednesdays, January 4 through April 12. Twenty-eight hours. Fee: $50.00.

Head and Neck. Wednesdays, April 12 through May 31. Twenty-four hours. Fee: $35.00.

Alumni Postgraduate Convention Refresher Courses, March 12 and 13, on the campus of the College of Medical Evangelists at White Memorial Hospital.

Joint Manipulation. Monday through Friday, March 20 through 24. Twenty hours. Fee: $100.00.

Tropical Public Health. Monday through Friday, April 3 through 28. Fee: $65.00.

Clinical Traineeships available in clinical departments by arrangement with Postgraduate Division and Postgraduate Chairman of department involved. In addition to those listed other traineeships in other departments can be arranged. Eighty hours minimum. Limited enrollment. Begin when individually arranged.

1. **Anesthesia.** Six months. 250 to 300 hours. Fee: $350.00.
2. **Internal Medicine.** Two weeks to nine months.
3. **Pulmonary Diseases** (can be arranged).
4. **Traumatology.** One month. 160 hours. Fee: $125.00.
5. **Urology** (can be arranged).

For information contact: Division of Postgraduate Medicine, College of Medical Evangelists, 1720 Brooklyn Ave., Los Angeles 33. ANgelus 9-7241, Ext. 214.

*Fee to be announced.

CALIFORNIA MEDICAL ASSOCIATION POSTGRADUATE INSTITUTES—1961

Southern Counties, February 2 and 3, El Mirador Hotel, Palm Springs, in cooperation with University of Southern California School of Medicine. *Chairman:* Raymond Tatro, M.D., 1875 North "D" Street, San Bernardino.

West Coast Counties, March 2 and 3, Del Monte Lodge, Pebble Beach, in cooperation with College of Medical Evangelists. *Chairman:* A. F. Kandlbinder, M.D., 835 Cass Street, Monterey.

North Coast Counties, March 23 and 24, Flamingo Hotel, Santa Rosa, in cooperation with University of California, San Francisco. *Chairman:* Milton A. Antipa, M.D., 50 Montgomery Drive, Santa Rosa.

San Joaquin Valley, April 13 and 14, Ahwahnee Hotel, Yosemite, in cooperation with UCLA School of Medicine. *Chairman:* J. Malcolm Masten, M.D., 1051 R Street, Fresno.

Sacramento Valley Counties, June 29 and 30, in cooperation with Stanford University School of Medicine, Tahoe Tavern, Lake Tahoe. *Chairman:* Joel T. Janvier, M.D., 3632 Marysville Road, Del Paso Heights.

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AUDIO-DIGEST FOUNDATION

A nonprofit subsidiary of the C.M.A., offers (on a subscription basis) a series of six different hour-long tape recordings covering general practice, surgery, internal medicine, obstetrics and gynecology, pediatrics and anesthesiology. Designed to keep physicians posted on what is new and important in their respective fields, these programs survey current national and international literature of interest and contain selected highlights of on-the-spot recordings of national scientific meetings, panel discussions, symposia, and individual lectures. Audio-Digest Internal Medicine will shortly be available on long-play discs, requiring only a 33 1/3 rpm phonograph to utilize the service. For information contact Mr. Claron L. Oakley, Editor, 1919 Wilshire Blvd., Los Angeles 57, HUbbard 3-3451.

Medical Dates Bulletin

NOVEMBER MEETINGS

AMERICAN COLLEGE OF PHYSICIANS Southern California Regional Annual Basic Science Lectureship. November 18, California Club, Los Angeles. Dinner and cocktails, 6:30 p.m. Speaker: Melvin Calvin, Ph.D., professor of chemistry, University of California, Berkeley. Subject: "Origins of Life." Members and invited guests. *Contact:* George C. Griffith, M.D., governor ACP, P.O. Box 25, 1200 N. State Street, Los Angeles 33. CApitol 5-3131, Ext. 7-1543.

SOUTHERN CALIFORNIA SOCIETY OF GASTROENTEROLOGY Panel Discussion "Enzymology and G.I. Diagnosis." November 22. Los Angeles County Medical Association. *Contact:* William E. Molle, M.D., secretary-treasurer, 6221 Wilshire Blvd., Los Angeles 48.

DECEMBER MEETINGS

California Chapter, American College of Chest Physicians. December 1 through 3. Palm Springs. *Contact:* S. J. Sills, M.D., President, 2007 Wilshire Blvd., Los Angeles.

Scripps Clinic and Research Foundation, electrocardiography, phonocardiography and vectorcardiography. December 8 through 10, 9 to 5 daily. Scripps Clinic and Research Foundation, La Jolla. *Contact:* E. Grey Dimond, M.D., Scripps Clinic and Research Foundation, La Jolla.

JANUARY MEETINGS

Los Angeles County Heart Association Mid-Winter Symposium. January 11. Statler Hilton Hotel. *Contact:* LACHA, 2405 W. 8th Street, Los Angeles.

Long Beach Heart, Cancer and TB Third Annual Medical Symposium on Diseases of the Heart, Lungs and Chest. January 18, 12:30 p.m., Long Beach Petroleum Club. *Contact:* Leslie R. Raymond, executive director, 2034 Pacific Avenue, Long Beach.

Thirtieth Annual Mid-Winter Convention in Ophthalmology and Otolaryngology. January 23 to 27. Statler-Hilton Hotel, Los Angeles. *Contact:* Norman Jesberg, M.D., treasurer, 500 South Lucas, Los Angeles 17.

Western Society for Clinical Research. January 26 through 28. Carmel-by-the-Sea, Calif. *Contact:* William N. Valentine, M.D., secretary-treasurer, UCLA School of Medicine, Los Angeles 24.

Fresno County Heart Association Ninth Annual Central California Cardiovascular Symposium. January 27. 8:30 a.m. to 5:30 p.m. Fresno Elks Club, 5080 E. Kings Canyon Road, Fresno. *Contact:* Jack J. Jacobson, M.D., chairman, Professional Services Committee, 1584 N. Van Ness Ave., Fresno.

FEBRUARY MEETINGS

American College of Physicians Southern California Region, Annual Meeting, in cooperation with Northern California and Nevada, Arizona and New Mexico. Biltmore Hotel, Santa Barbara, February 3, 4, 5, 1961. Abstracts (300 words) of papers for consideration of presentation at the meeting should be sent in triplicate before November 1 to Sherman Mellinkoff, M.D., chairman, scientific program committee, U.C.L.A. Medical Center, Los Angeles 24.

Institute for Metabolic Research "Lipid Metabolism in Diabetes and Related Conditions" two-day round table symposium. February 7 and 8. Highland-Alameda County Hospital, Oakland. *Contact:* L. W. Kinsell, M.D., director, Institute for Metabolic Research, 2701 14th Ave., Oakland.

West Contra Costa Branch of California Academy of General Practice Evening Lectures in Medicine by University of California Medical School Faculty. Thursdays, February 9 through March 16. Richmond. *Contact:* D. D. Vollan, M.D., chairman, Education Committee, 184 24th St., Richmond.

Obstetrical and Gynecological Assembly of Southern California, 16th Annual Mid-Winter Clinical Assembly. Ambassador Hotel, Los Angeles, February 13 through 17. *Contact:* Dee Davis, executive secretary, 5478 Wilshire Blvd., Los Angeles 36, WEbster 4-1551.

Los Angeles Society of Neurology and Psychiatry in cooperation with California Spinal Cord Research Foundation, Conference "Recent Contributions of Basic Research to Paraplegia." February 17 and 18. Los Angeles. *Contact:* Robert P. Sedgwick, M.D., secretary-treasurer, 2010 Wilshire Blvd., Los Angeles 57.

California Tuberculosis and Health Association, California Trudeau Society Annual Joint Meeting. February 19 through 22, Jack Tar Hotel, San Francisco. *Contact:* Executive director, C.T.H.A., 130 Hayes Street, San Francisco.

Southern California Society of Gastroenterology. "Problems and Pitfalls in Differential Diagnosis of Jaundice"—Leon Schiff, M.D., February 27, Los Angeles County Medical Association. *Contact:* William E. Molle, M.D., secretary-treasurer, 6221 Wilshire Blvd., Los Angeles 48.

MARCH MEETINGS

Southwestern Pediatric Society Postgraduate Lecture Series. March 7 and 8, Statler Hotel, Los Angeles. *Contact:* Harry O. Ryan, M.D., secretary, 194 N. El Molino, Pasadena.

Anesthesia Section of Los Angeles County Medical Association 6th Annual Spring Postgraduate Meeting. March 11 and 12. Statler Hilton Hotel, Los Angeles. *Contact:* Thomas W. McIntosh, M.D., 686 East Union Street, Pasadena.

College of Medical Evangelists Annual Alumni Postgraduate Convention. Scientific Assembly, Ambassador Hotel, March 14, 15 and 16. *Contact:* F. Harriman Jones, M.D., general chairman, College of Medical Evangelists, 316 North Bailey Street, Los Angeles 33.

SPRING AND SUMMER MEETINGS

Industrial Medical Association. Biltmore Hotel, Los Angeles, April 11 through 13. *Contact:* Leonard Arling, M.D., secretary, The Northwest Industrial Clinic, 3101 University Avenue, S.E., Minneapolis 14.

California Medical Association Annual Meeting, Ambassador Hotel, Los Angeles. April 30 through May 3. *Contact:* John Hunton, executive secretary, 693 Sutter Street, San Francisco 2; or Ed Clancy, director of public relations, 2975 Wilshire Blvd., Los Angeles 5.

Medical Staff of Children's Hospital of the East Bay Ninth Annual Clifford Sweet Seminar. May 18, 19 and 20. Hotel Claremont, Berkeley, and Children's Hospital of the East Bay. *Contact:* Seymour J. Harris, M.D., chairman, Lectureship Committee, 401 29th Street, Oakland 9.

Memorial Hospital of Long Beach, Third Annual Medical Staff Symposium. May 24. New Memorial Hospital, 2801 Atlantic Ave., Long Beach 6. *Contact:* George X. Trimble, M.D., secretary, Memorial Hospital of Long Beach.

Western Branch, American Public Health Association Annual Meeting (joint with U. S.-Mexico Border Public Health Association). June 26 through 29. El Cortez Hotel, San Diego. *Contact:* Robert E. Mytinger, M.P.H., director, Executive Office Western Branch, APHA, 693 Sutter Street, San Francisco 2.

THE PHYSICIAN'S *Bookshelf*

POSTURAL FITNESS—Significance and Variances—Charles LeRoy Lowman, M.D., Sc.D., F.A.C.S., Chief of Staff Orthopedic Hospital, Emeritus; Director School, Physical Therapy, University of Southern California; and Carl Haven Young, Ed.D., C.C.T., F.A.A.P.M.R., Professor of Physical Education, University of California, Los Angeles. Lea & Febiger, Washington Square, Philadelphia 6, Pa., 1960. 341 pages, 61 illustrations, $7.50.

The authors draw on a wealth of experience in reconstructive orthopaedic surgery, rehabilitation, and physical education to formulate this very complete and most readable work on posture. They have been able to give the reader an understanding of the basic elements of posture: (1) The significance of each body part; (2) the normal posture and variations from the normal; (3) means of recovery from abnormal posture or postural defects; (4) the description of man's posture in all stages as it develops from infancy to maturity.

The surprisingly high percentage of individuals making up the normal population where postural defects are found is emphasized. The contributing muscular deficiencies in faulty posture are thoroughly explained. Possible means of overcoming these muscular deficiencies are outlined.

These individuals naturally look to the physicians for help in regulating their posture. The authors emphasize that exercises must be far more specific than sports and games for recreation if posture is to be improved. It is then pointed out that resulting improvement in posture may result in improvement in some of the body organ systems such as the respiratory system and the digestive system.

The book will serve as an excellent text for students majoring in physical education, teachers in the area in corrective or adaptive physical education, and for those working in clinical situations, such as physicians, therapists, and nurses. Definite sets of exercises described in complete detail are outlined for various postural deficiencies. Outlines for various types of fitness programs are given.

This text is the result of a complete analysis and treatment of the subject. It is all-inclusive and it is most difficult to think of any pertinent aspect of posture omitted.

J. R. Close, M.D.

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ELECTROCARDIOGRAPHIC TECHNIQUES—A Manual for Physicians, Nurses and Technicians, Second Revised and Enlarged Edition—Kurt Schnitzer, M.D. Grune & Stratton, Inc., 381 Fourth Avenue, New York 16, N. Y., 1960. 109 pages, $4.75.

This is the second edition of a practical manual on the technique of electrocardiography for technicians and nurses. It is an excellent, easily read book which in the reviewer's opinion is the best available for the beginning technician. It begins with a short, simple account of the circulation and a description of the conduction system of the heart. The electrocardiographic instrument is clearly described and there are good accounts of such things as standardization, lead selectors, electrodes, stylus, etc. A particularly good account concerns the artifacts which interfere with the proper record and ways in which the technician can recognize them. The actual recording of the electrocardiogram is clearly described and illustrated. There is a short account of exercise tests and vectorcardiography as well as a short bibliography.

This book can be highly recommended as a clear, concise introduction to electrocardiograph technique and will be of special value to the new technician.

Maurice Sokolow, M.D.

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ANOREXIA NERVOSA—Its History, Psychology, and Biology—A Psychosomatic Medicine Monograph—Eugene L. Bliss, M.D., Associate Professor of Psychiatry, University of Utah College of Medicine; and C. H. Hardin Branch, M.D., Professor and Head of the Department of Psychiatry, University of Utah College of Medicine. Paul B. Hoeber, Inc., Medical Division of Harper & Brothers, 49 East 33rd Street, New York 16, N. Y., 1960. 210 pages, $5.50.

This book is built upon an intelligent appraisal of twenty-two patients with anorexia nervosa. Stimulated by their own rich experiences the authors have carefully analyzed and beautifully and clearly reported accounts bearing upon anorexia nervosa from ancient to modern times. There follows a well-organized description of the clinical aspects of anorexia nervosa, including the helpful, common, and unusual features of physical examination, psychodynamic aspects, laboratory and endocrine findings, and treatment. Finally the case reports themselves are excellent illustrations, and the bibliography is extensive.

This book is highly recommended for physicians and students alike, and can be used with great profit to study anorexia per se, for specific reference to look up points of interest in connection with a patient or a research problem, and as a model for the presentation of an intriguing medical problem.

Sherman M. Mellinkoff, M.D.

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NUMERICAL PROPERTIES OF FUNCTIONS OF MORE THAN ONE INDEPENDENT VARIABLE—Annals of The New York Academy of Sciences, Volume 86, Art. 3; Pages 677-874. Published by The New York Academy of Sciences, 2 East Sixty-third Street, New York 21, New York, 1960. 197 pages, $3.00.

This monograph is of interest to graduate mathematicians with a specialized interest in computations and numerical analysis. It contains several papers giving new results in domains of mathematics which are of growing practical importance as a result of the increasing applicability of electronic computers.

Lincoln E. Moses, Ph.D.

NINE MONTHS' READING—A Medical Guide for Pregnant Women—Robert E. Hall, M.D. Illustrated by Robert Demarest. Doubleday & Company, Inc., Garden City, New York, 1960. 191 pages, $2.95.

"Nine Months' Reading" is a superb book which provides approximately four hours of interesting and informative reading. In 186 pages Dr. Hall has compiled an all-encompassing survey of the adventures of the pregnant woman and her intra-uterine citizen. In a lucid and nonflowery style, this book contains an intelligent answer to almost every conceivable question the most querulous "primipara" could ask. Particular attention has been devoted to an understandable explanation of the Rh problem, and to a frank and thorough description of labor and delivery. In his discussion of the various aspects of pregnancy and birth the author salts his information liberally with his own opinions which are authoritative and not in the least vacillatory: "But if you want to scream, go ahead. You won't be the first or the last or the loudest."

Two subjects in particular are obviously dear to Dr. Hall's heart: for 18 pages he ardently expounds his views on breast feeding, "it radiates love," and natural childbirth, "jungle obstetrics." There is no brain washing attempted, simply an articulate and pungent expression of his opinions.

The contemporary aspects of 1960 obstetrics are covered accurately, for the most part, from an explanation of prenatal sex determination by study of the amniotic fluid cells to advice on the levels of radioactive strontium 90 in milk. One exception is the description of the chromosomal number as twenty-four pair, instead of the correct figure of twenty-three pair.

Dogmatic statements abound in this book but only rarely do they provoke skepticism as to their factual basis, viz., "gamma globulin is useless in preventing German measles." Dr. Hall's authoritative manner even extends to an admonishment to parents, "Don't give the baby a family name," with a paragraph explaining the psychiatric reasons for his philosophy.

In the opening paragraph of the final chapter, the author counsels his pregnant patients that the moment of returning home from the hospital with the new born is an exalting and triumphant one, so, "Don't mess it up." Following this imperious advice, there is an excellent section crammed with the same common-sense with which the book is saturated.

A very helpful glossary is provided and an adequate index.

A dozen barely adequate illustrations with substandard descriptions do not add to the effectiveness of the text.

The book costs three dollars, and it is hard to imagine a better investment for any pair of prospective parents and their obstetrician.

JOHN V. KELLY, M.D.

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PARDON MY SNEEZE—2nd Edition—The Story of Allergy—Milton Millman, M.D., Fellow American College of Allergists; Member American Academy of Allergy; and Past President San Diego Biomedical Research Institute. Kuchirka Books, P.O. Box 8144, San Diego 2, Calif., 1960. 215 pages, $4.00.

This is an excellent little book, written with the purpose of clarifying the causations, diagnosis and treatment of allergic diseases to the layman. Unfortunately, it will miss the bulk of its projected buyers, for only the most intelligent and cooperative laymen would read and profit by it. The practicing allergist can learn from this volume how to answer the patient's questions satisfactorily. Doctors who are not allergists and who have never had any formal training in allergy should read a book like this, not only for their own benefit but for that of their patients. It would enable said doctors to direct people suffering from misdiagnosed "sinusitis," "bronchitis," "neurodermatitis," "indigestion," etc., to a competent allergist. Pardon My Sneeze could easily be expanded into an elementary textbook of allergy suitable for senior medical students or practitioners desiring a brief survey.

The first two-thirds of the book, dealing with allergic mechanisms, diseases and diagnosis, is the best. Most of the latter third is on the subject of food allergens, diaries, diets, etc. The reviewer thinks that the author has set the incidence and importance of food allergy too high. There are excellent lists of allergens and where to look for them. The section on air filtration is worthy of greater expansion and detail, along the lines of Max Samter's lectures.

In trying to make medical subjects more palatable to the layman, doctors often lean over backward to be humorous. The author has done this also. The title of "Pardon My Sneeze" appeals only to the more frivolous. The numerous cartoons, though clever, are distracting and add an air of levity to a well written discourse on a serious subject. They could possibly be put in a separate section at the end of the book.

As long as the average patient wants everything to be done for him by the doctor, books like this will not be as widely read as they deserve to be.

MILTON M. HARTMAN, M.D.

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SIGNIFICANT TRENDS IN MEDICAL RESEARCH—Ciba Foundation, Tenth Anniversary Symposium—Editors for the Ciba Foundation, G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P.; Cecilia M. O'Connor, B.Sc., and Maeve O'Connor, B.A. Little, Brown and Company, Boston, Massachusetts, 1959. 356 pages, with 41 illustrations, $9.50.

This volume, the fiftieth in the series of the CIBA Foundation Symposia, is in many ways the best of the series and a remarkable book. The symposium was held to celebrate the tenth anniversary of the Foundation and the participants are a star-studded cast. Seven Nobel prize winners are included in those contributing to the discussions. The subjects range from molecular structure by Pauling to research in clinical nutrition by Brock and include a ten-year general survey of the field of neurophysiology by von Muralt, the nature and mechanism of action of hormones by Young, population dynamics of body cells by Burnet, genetics and medicine by Waldenström, malignant transformation by Haddow, chronic pulmonary disease by Richards, metabolic problems involving the pancreas by Best, biochemical chapters by Theorell and Schramm, essential hypertension by Pickering and a final chapter describing medical research in the U. S. by Shannon. Each paper is followed by a lively and penetrating discussion devoted primarily to classification of concepts.

The reaction that one gets to this book is of excitement —not only because of the great strides that have been made during the past ten years but because of the bold, broadly conceived concepts of the developments to be expected in the next ten years. The wide sweep from genes to enzymes to molecules to clinical disease will be of great interest to clinicians who have not perhaps been aware of the great strides that have been made in this direction. Predictions of future developments were made rather confidently by Pauling who stated that he estimates "1st March 1967 $\pm$ 2.5 years as the date when the announcement will be made that the first complete structure determination for a protein molecule, the determination by experiment (x-ray diffraction) of the relative positions in space of all of the atoms in the molecule, has been accomplished." When this and other knowledge regarding protein molecules has been

achieved, detailed understanding of the mechanism of action of genes and enzymes and of the manner in which abnormal molecules produce disease will transform medicine from "macroscopic and cellular medicine to molecular medicine."

All of the participants agreed that one of the most significant trends in research in the past few years was the attempt to describe biological phenomena in chemical and physical terms. Schramm's chapter elaborates this theme, particularly with respect to the gene as the producer of a specific enzyme and the consequences thereof. Burnet summarized his contribution "that the phenomena of immunity are based on an evolved specialization of the capacity of all cells to mutate, that cancer is a manifestation of the selective short-term survival of cells which have gained proliferative advantage by sequential mutation, and that old age and death represent the cumulative effect of a burden of somatic mutation in the body cells."

Von Muralt summarizes very succinctly the ionic theory of excitation and the relationship between the nerve impulse and the contraction of muscle. He considers the "single unit approach," the intra-cellular microelectrode and radioactive isotopes as making possible the insights of the last decade in his field.

Many more illustrations could be given but perhaps enough has been said to whet the reader's appetite for a stimulating adventure into the thinking of superb minds. The book can be very heartily recommended.

MAURICE SOKOLOW, M.D.

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EXPERIMENTS AND OBSERVATIONS ON THE GASTRIC JUICE AND THE PHYSIOLOGY OF DIGESTION—William Beaumont, M.D., Surgeon in the United States Army. Facsimile of the Original Edition of 1833, together with a Biographical Essay, A Pioneer American Physiologist, by Sir William Osler. Dover Publications, Inc., 180 Varick Street, New York 14, New York, 1960. 279 pages, $1.50.

Most people are not aware of William Beaumont's excellence as a physiological observer, and doctors are indebted to the editor and the publishers of this admirable reprint of "The Physiology of Digestion." The original issues have become very scarce and expensive, the first and second issues of the Plattsburgh volume now bringing about from $40 to $80 and thus being not readily available.

Furthermore ancillary matter of great interest has been incorporated with the reprint of the original book. Osler's essay on the "backwoods physiologist" telling much of the exciting story of Beaumont's relations with the temperamental St. Martin makes delightful reading.

The observations are too well known to allow analysis in this review; suffice it to say that their clarity and precision are unsurpassed in this sort of writing. Beaumont laid the foundations of the modern concepts of the physiology of digestion; more than this he cleared away much confusion and unsoundness in connection with the subject.

ARTHUR L. BLOOMFIELD, M.D.

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THE LIST METHOD OF PSYCHOTHERAPY—Elizabeth Sher, Eleanor Messing, Theodora Hirschhorn, Enis Post, Annette Davis, and Arthur Messing. With an Introduction by Jacob S. List. Philosophical Library, 15 East 40th Street, New York, 1960. 258 pages, $7.50.

This book consists of a collection of papers written by the "disciples" of Jacob List, each one of whom had been previously treated and trained by him. The method he uses, which is described, relies heavily on a planned interaction between patients in the reception room and in other social situations designed to alter a patient's patterns of behavior, and on patients' returning to school in order to divert their attention from the problems which make them seek help in the first place. It would appear that patients who are treated by List and his group are those who are already aware of the existence of self-defeating patterns of behavior and who wish to change.

List is a former probation officer who studied psychology but was disillusioned by it as a discipline that could help people. He emphasizes that none of the contributors to this volume are "psychologists"—"they are holders of doctorates in education, not in psychology in the American Psychological Association sense." He belittles the experimental approach and emphasizes the interpersonal and social origins of neurotic disorders that were originally stressed by Fromm, Horney, and Sullivan.

He makes no distinction between types of cases treated; diagnosis is not mentioned. He provides no valid proof for the generalizations that are made regarding treatment. He uses Ferenczi as the authority to justify the warm, close relationship he fosters between the patient and his therapist—which includes such things as going to the toilet together, in part to facilitate discussion of bodily functions.

It is of interest that clients are sometimes referred to as "patients" and sometimes as "clients," suggesting some confusion in the self-image of the therapist. Psychotherapists are repeatedly equated with psychoanalysts—as if they were the same.

The book attempts to justify the entrance into one or another phase of the practice of medicine of individuals who possess unique ability rather than the minimal educational standards now required. It represents an approach that threatens to produce a chaotic situation in the healing arts and especially in the treatment of patients with emotional disorders—an approach which is consistent with the increasing trend on the part of social scientists to view man as a psychological organism rather than a psychobiological organism who is adjusting to his culture as well as to many other forces.

NORMAN Q. BRILL, M.D.

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ANATOMY—A Regional Study of Human Structure—Ernest Gardner, M.D., Wayne State University; Donald J. Gray, Ph.D., Stanford University; and Ronan O'Rahilly, M.Sc., M.D., Wayne State University. Illustrated by Caspar Henselmann. W. B. Saunders Company, Philadelphia, 1960. 999 pages, $15.00.

The number of hours devoted to Gross Anatomy in the medical school curriculum has been drastically cut during the past few decades. A remedy for this condition has been the appearance of several textbooks written from the regional approach for more rapid comprehension by the student. The most recent and in many ways the best of these regional treatises is the collaborative effort of three eminent anatomists, Dr. Gray of Stanford University and Drs. Gardner and O'Rahilly of Wayne State University.

With about seventy-five years of collective teaching experience, these authors have assembled the basic facts, principles and concepts of anatomy with a clear, fresh viewpoint. After several brief authoritative introductory chapters on systematic anatomy, development and growth and radiological anatomy, the body is presented regionally, starting with the extremities and ending with the head and neck.

The regional descriptions include unique chapters on surface anatomy, physical examination and radiological anatomy. The book is superbly illustrated, with abundant original semidiagrammatic line drawings to clarify developmental aspects and functional concepts and with carefully selected photographs from life and x-ray plates. Descrip-

tions of embryology are especially authoritative in the realm of bones and joints. The new (1955) Noma Anatomica terminology is used with English translations wherever possible and synonyms wherever necessary. Eponyms are avoided in the text, but a glossary of commonly encountered eponyms is provided as an appendix.

The advanced student of anatomy will appreciate the numerous bibliographical references to the recent literature. Although this book will not replace the longer standard systematic texts (such as the one by another Gray), it may well relegate the latter group to the status of reference books.

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ESSAYS ON THE FIRST HUNDRED YEARS OF ANAESTHESIA—Volume 1—W. Stanley Sykes, M.B.E., M.B., B. Chir. (Cantab.), D.A., Late Anesthetist to the General Infirmary at Leeds, to the Hospital for Women and St. James' Hospital, Leeds, to the Leeds Dental Hospital, to the Halifax Royal Infirmary and to the Dewsbury General Hospital. Distributed in the United States by The Williams & Wilkins Co., Baltimore 2, Md., 1960. 171 pages, $7.00.

One of Macaulay's essays opens with the statement, "We do not recall ever having seen an equal amount of matter which pleased us less." The reverse could be said about this delightful book. It consists of a series of essays on the history of anesthesia, not continuous but yet connected, which really cover the entire early story of the subject. Dr. Sykes, himself an "anaesthetist," writes in a delightfully witty style which would make his book pleasant reading even for a layman, and still he is a precise historian who has delved into the sources and has documented all his statements. There are numerous illustrations which enlighten the text appropriately.

Although this volume seems complete it is apparently Volume I of a series. One will look forward with interest to further essays on this subject.

ARTHUR L. BLOOMFIELD, M.D.

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DIAGNOSTIC ROENTGENOLOGY OF THE DIGESTIVE TRACT WITHOUT CONTRAST MEDIA—A Mount Sinai Hospital Monograph—Bernard S. Wolf, M.D., Director, Department of Radiology, The Mount Sinai Hospital, New York; Associate Clinical Professor of Radiology, Columbia University; Mansho T. Khilnani, M.B., Associate Fellow in Radiology, The Mount Sinai Hospital, New York; and Arthur Lautkin, M.D., Associate Radiologist, The Mount Sinai Hospital, New York; Associate Radiologist, Flower Fifth Avenue Hospital; Associate Clinical Professor, New York Medical College. Grune & Stratton, Inc., 381 Fourth Avenue, New York 16, N. Y., 1960. 180 pages, $8.75.

This monograph presents in orderly fashion a discussion of the diagnostic value of plain roentgenograms of the abdomen. Emphasis is placed on those conditions which may be unsuspected clinically. Mechanical obstruction and perforated viscus are therefore not included.

The four sections commence with general principles, and proceed through gastric, small bowel, and colonic lesions. The discussion under general principles is a good summary of basic physiology and anatomy of the intestinal tract. The attainment of as much information as possible from plain films of the abdomen is important and should be pursued; however, to be realistic, many lesions are not clearly delineated even with contrast studies. In general, most of the lesions discussed have to be confirmed with contrast studies.

The chapter on gastric lesions is divided into the normal stomach, gastric neoplasms, benign peptic ulcer and miscellaneous conditions. As in the first chapter, the discussion is followed by illustrations depicting the principles of the text. Intrinsic lesions such as gastric carcinoma are not clearly separable from extrinsic masses by the illustrations. However, there is good correlation between the plain films and subsequent barium studies.

The section on the small bowel includes discussion and illustration of the duodenum, normal small bowel, tumors, inflammatory disease, vascular disorders, and miscellaneous small bowel lesions. The lesions described are not at all convincing on the plain films.

The final chapter on the colon contains subsections on the normal colon, carcinoma, ulcerative colitis, and miscellaneous lesions. The author feels that plain films are superior to contrast studies in acute ulcerative colitis due to the obliteration of functional changes from the nonphysiologic distention required at barium enema.

Organization of the material is simple and effective. The text is easily readable, references adequate, and reproduction of illustrations good.

The monograph is recommended to residents in radiology and to practicing radiologists as a reference. To physicians not experienced in radiology, this material might lead to gross over-reading in many instances.

JOHN H. HEALD, M.D.

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MINORITY, A—A Report on the Life of the Male Homosexual in Great Britain—Gordon Westwood; Longmans, Green & Co., Inc., 119 West 40th Street, New York 18, N. Y., 1960. 216 pages, $7.00.

According to the flyleaf this book contains the results of the most extensive research on the subject of male homosexuality yet to have been published. Over a period of two years the author met and talked with more than 100 homosexuals and obtained factual information on their family background, social behavior, and sexual activities. The author makes the comment that in no other field of scientific research is there to be encountered the antipathy and the obstacles which one sees in any aspect of sexual research, particularly that involving the sexual deviations. He points out how very little is known about homosexuality and about those who commit homosexual acts and what a dearth of material there is available on the social and familial antecedents of homosexuals.

One hundred twenty-seven homosexuals were interviewed. Information was obtained on their family backgrounds, relationships to parents and siblings, the nature and character of their early homosexual experiences, extent of homosexual acts and interests, and the nature and quality of the adjustment or lack of same to their homosexuality. The author makes the valuable point that homosexuality is not just a sexual problem alone, that it forces those who practice it into a minority group which obeys the same rules of social and psychological behavior as do minority groups of a religious and racial character. The sample has the value that it embraces persons of mixed educational, work, and social backgrounds and, in contradistinction to other studies of this character, interviews and contacts subjects who lead useful and productive lives.

While there is a real dearth in the literature of scientific studies of the antecedents and personality development of any statistically significant sample of persons with paraphiliac sexual interests, this study is far from meeting the need. The interviews were not done in sufficient depth and the anamnestic material gained, while valuable, leaves large areas of personality and social orientation unexplored and untapped. A definitive study of this type has yet to be done, but anyone contemplating such a study could obtain valuable information and leads from this book.

C. W. WAHL, M.D.

YEAR BOOK OF DRUG THERAPY, THE—(1959-1960 Year Book Series)—edited by Harry Beckman, M.D., Director, Departments of Pharmacology, Marquette University Schools of Medicine and Dentistry; Consulting Physician, Milwaukee County General and Columbia Hospitals, Milwaukee, Wisconsin. The Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1960. 570 pages, $8.50.

The Year Book of Drug Therapy has always been a good volume to consult for abstracts about new drugs in the practice of medicine. This year it is even better than usual as Dr. Beckman proceeds from unadorned abstracting and the editing of abstracts to the next stage . . . an evaluation of the current drugs and their place in modern medicine. In his introduction to this volume, he discusses the relationship of the manufacturing drug industry and its advertising to doctors and the practice of medicine. He shares the apprehension which most thoughtful physicians have about the increased amount of drug advertising, the methods used in detailing drugs, ("the contrived illustration and gaudy and expensive colored releases"), the attempts to make bibliographic references worth more than they are worth, and the occasional gross misrepresentation. As he sees it, "this development is but part and parcel of the new order of things in the world"—just one of the many problems of our era. And this book will help to cope with it.

Two new chapters are added. The first is entitled "Bases for Judgment of a New Drug." The considerations which are important include how the drug was produced, the need for the drug, whether it is worth the price, and what side actions or contra-indications may be predictable. Dr. Beckman emphasizes the need for confirmation of the manufacturer's findings by independent, interested and competent investigators.

The second new chapter comprises a catalogue of the new drugs released for market by the Food and Drug Administration during the twelve months preceding press time for this volume. In this section, there are 334 items on which Dr. Beckman comments briefly. This is the best comprehensive summary of new drugs which the reviewer knows, and is a veritable strip-mine of readily available information.

The general body of the book seems to improve as the years go by. We enjoy particularly Dr. Beckman's comments, which are often entertaining as well as enlightening.

EDGAR WAYBURN, M.D.

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HEAD, NECK, AND TRUNK, THE—Muscles and Motor Points—2nd Edition—By Daniel P. Quiring, PhD., Late Head of the Anatomy Division, Cleveland Clinic Foundation and Associate Professor of Biology, Western Reserve University. Revised and Edited by John H. Warfel, Ph.D., Assistant Professor of Anatomy, The University of Buffalo, School of Medicine, Buffalo, New York. Lea & Febiger, 600 Washington Square, Philadelphia 6, Pa., 1960. 124 pages, 109 illustrations, $3.25.

It is difficult to define the exact place wherein a book such as this will find its greatest utility. The second edition, like the first, presents a concise and well-portrayed series of anatomical outline drawings illustrating the voluntary musculature of the head, neck and trunk on an individual basis, together with appropriate nervous and vascular relationships. Consequently it is of considerable value as an adjunct to the definitive reference works in gross anatomy, i. e., Gray or Cunningham, to each of which citations are made in the descriptive text. To this extent, it achieves quite successfully its aims.

Its principal shortcomings, it seems to me, result from the fact that works of this type are neither texts nor atlases, and cannot substitute for either. As a reminder for the professional man in medicine or dentistry, I would expect such a volume might be referred to frequently. As an aid to the freshman medical student, already burdened with oversized text-books, atlases and dissecting manuals, I venture to guess its utility would be something less than great.

I have no hesitation in recommending this volume, together with its companion (The Extremities), as a worthwhile addition to the libraries of practicing surgeons and dentists. However, I cannot help but wonder how long a time it will be before revised editions of Cunningham or Gray make obsolete the page citations presented in this book.

R. C. GREULICH

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YOUR CHILD'S CARE—1001 QUESTIONS AND ANSWERS—A New, Revised, and Enlarged Edition of "A Pediatric Manual for Mothers"—Harry R. Litchfield, M.D., F.A.C.P., and Leon H. Dembo, M.D.,; Doubleday & Company, Inc., 575 Madison Avenue, New York 22, N. Y., 1960. 257 pages, $3.95.

This volume is a compilation of 1,000 questions with sensible answers that mothers have asked the authors in the long years of their experience. The subjects cover practically the whole experiences of the parent and child in his journey from the fetus through the age of childhood in his emotional, physical and pathological experiences. The answers are clear, concise and fully explanatory. The answers do not include treatment and reference is constantly made to the doctor for such treatment and correction. It is a book for mothers and as such will be of great help to them in the care of their children. The answers given by the authors are in complete conformity with modern pediatric practices.

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HEART IN INDUSTRY, THE—By Twenty-Four Authors — Edited by Leon J. Warshaw, M.D., F.A.C.P., Consultant in Occupational Health; Medical Director, Paramount Pictures Corporation; Medical Director, United Artists Corporation, New York. Foreword by Irving S. Wright, M.D. Paul B. Hoeber, Inc. Medical Division of Harper & Brothers, 49 East 33rd Street, New York 16, N. Y., 1960. 677 pages, $16.00.

With the increasing importance of and interest in the industrial aspects of cardiac disease this is the second volume on the subject to appear recently (the other: "Work and the Heart," by Rosenbaum and Belknap). The major subjects covered in the book include the physiological effect of work on the heart, rehabilitation and placement of the cardiac, psychiatric aspects of cardiovascular disease in industry, cardiovascular effects of toxic occupational exposures, traumatic heart disease and many others. Most of the chapters are authoritatively written and easily readable. A certain redundancy inherent in multiple authorship is apparent, as its unnecessary lengthiness of some subjects. For example, the chapter "Detection and Evaluation of Heart Disease in Industry" includes a description of history, physical examination, roentgenology, electrocardiography and special diagnostic procedures—in short, the entire subject of diagnostic cardiology. Obviously, those unfamiliar with the subject will not be able to acquire the knowledge of it from a 60-page chapter; others will find a good part of the chapter superfluous. Bibliography is uneven: some chapters contain a well-chosen, fairly comprehensive coverage of the subject, others include a mere handful of references. As a whole, the book is a valuable addition to a cardiologist's library; it covers many subjects which are not often included in conventional texts of cardiovascular disease. It is recommended not only to physicians who have dealings with industrial medicine but to internists and cardiologists in general, for the evaluation of the patient's ability to work is part and parcel of medical practice.

A. SELZER, M.D.

BABY TALK—Morris Val Jones, Ph.D., Specialist in Speech and Hearing, School for Cerebral Palsied Children, San Francisco, California; formerly, Associate Professor of Speech, Illinois State Normal University, Normal, Illinois. With a Preface by John Wedell, M.D., Chief, Medical Staff, School for Cerebral Palsied Children, San Francisco, California. With an Introductory Statement by E. A. Lown, Superintendent, School for Cerebral Palsied Children, Northern California, San Francisco, California; Charles C. Thomas, Publisher, 301-327 East Lawrence Avenue, Springfield, Illinois, 1960. 96 pages, $4.50.

The title of this valuable book was jarring to the reviewer for it does not appeal to the fundamental causes of speech difficulties . . . even though "baby talk" is defined on the first page of the text as "when the pattern of sounds omitted, substituted, or defective in other ways resembles the typical speech of the young, it is often referred to as 'baby talk.'" There is so much in the text that covers the parent child relationship, the organic and psychological causes of speech defects that a better title could have been chosen.

It is difficult to know for whom the book was written, the physician dealing with children, the mother who has a child with a speech defect or a speech therapist. The physician could use the book as a text to be used in evaluating a speech defect problem and as a guide to the mother in analysis and self help. If written solely for the mother without professional help she would become discouraged before she got very far. Yet the whole text is directed to mother. There are a series of 10 quizzes and answers to each question in an appendix. These are excellent in developing the mother's understanding of the problem and its solution. But with all this the mother is met with such statements as "your program may end in failure." Its worth is more for the speech therapist to use this volume as a text book for the parent under his guidance. As such it is well worth while.

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CELLULAR ASPECTS OF IMMUNITY—Ciba Foundation Symposium—G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P., and Maeve O'Connor, B.A., editors for the Ciba Foundation. Little, Brown and Company, Boston, 1960. 495 pages, $10.50.

One has only to peruse the list of contributors to this Symposium to realize that it contains a large majority of the most prominent investigators in the rapidly evolving field of immunology. Among the 34 participants from all places in the world are such names as Sir Macfarlane Burnet, P. B. Medawar, J. Lederberg, H. S. Lawrence and many others.

The Symposium was held in London in early June 1959 and is another one of the many timely topics to be supported and published by the Ciba Foundation. Because of the rapidly changing character of the field of cellular immunity the editors are to be commended for the prompt publication of this monograph.

The contents consist of 20 chapters and several shorter communications. Nearly all of the material is presented clearly and concisely and the experimental data that is given is carefully limited to the topic under discussion. In addition to the presentation of facts and observations a considerable amount of stimulating theoretical speculation is also indulged in especially in regard to the phenomenon of immunological tolerance and to the clonal selection theory of antibody formation. The contents of the discussion which followed each paper are published in detail and greatly enhance the formal topics. Often as many as 10 or 12 experts engage in these revealing discussions.

So many complex topics are dealt with in this book that it is obviously impossible to even mention more than a few of them. In general the first several chapters deal with various aspects of the immunologically competent cell which has now assumed the central role in immunology, replacing the antibody from this position. Lively discussion then centers about the function of the plasma cell, the small lymphocyte and the various mechanisms whereby antibodies may be formed and immunologic information conveyed from one competent cell to its descendants. Other topics, slightly aside from this central basic theme, are discussed in the final few chapters.

In general there has been condensed into this relatively small volume a remarkable amount of information by leaders in the field. It is clearly printed on good quality paper and the illustrations are excellent. Currently it is the most authoritative accumulation of topics in immunology. The book should be required reading for all persons entering the field of immunology as well as for others within and those on the periphery of this increasingly important field. The editors as well as the Ciba Foundation and the publishers are to be congratulated for their foresight in the organization and pursuance of this Symposium.

CARL M. PEARSON, M.D.

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OTHER CHILD, THE—THE BRAIN-INJURED CHILD—A Book for Parents and Laymen—Second Revised and Enlarged Edition—Richard S. Lewis, Alfred A. Strauss, and Laura E. Lehtinen. Grune & Stratton, Inc., 381 Fourth Avenue, New York 16, N. Y., 1960. 148 pages, $3.75.

In certain areas of writing, texts designed for the laity make very excellent medical reading because of their clarity and because of the forcefulness of their presentation. This little book, concerned with brain-damaged children, is an excellent example of such a text. Drawing on the excellent work of Strauss and Lehtinen, the book describes in considerable detail the problems faced by the brain-injured child and the reasons that his care may be difficult but also can be helped. It is important that the book starts out in describing these children not with a description of the motor behavior and the clumsiness, symptoms so commonly attributed to these children: but of the major difficulty, namely that of perception. Quite logically the chapters of the book proceed from perception through conception and language, and then last to behavior. Thus, the individual concerned with the erratic, impulsive behavior of some of these children is prepared on the basis of knowledge of the central problem for an approach to their management. Here the book is especially good in that it describes the possibilities of management for teachers and parents in words that are easily understandable and which have real meaning to those who have to have close contact with such children. Finally a chapter on education summarizes the current thinking about the care of such children, and points out the greater opportunities for education that are available under better organized auspices. All in all, this is a most readable little text and one that would be a great service to anyone dealing with children who is confused by the curious problems of the brain-injured child.

HENRY H. WORK, M.D.